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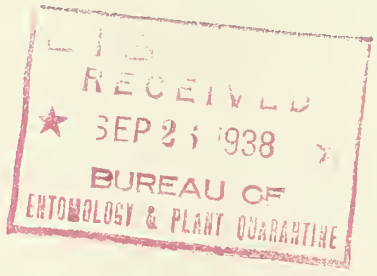

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THE SPECIES AND DISTRIBUTION OF GRASSHOPPERS IN THE 1937 OUTBREAK

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The year 1937 was the fourth in which grasshoppers were collected in typical environments in the several States included in the annual grasshopper survey. Data from the 1934, 1935, and 1936 collections were published as supplements to the Insect Pest Survey Bulletin as follows: Nos. 9 in volume 14, 5 in volume 16, and 3 in volume 17, respectively.

The present report is based on data from collections made in 17 States, namely, Arkansas, Arizona, Colorado, Iowa, Kansas, Michigan, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wisconsin and Wyoming. These collections totaled 175,022 specimens. All were determined as to species or were classified undetermined as nymphs and other forms, and then counted. This represented an immense amount of work and should be credited to F. E. Skoog, field assistant, who had charge of the work of identification.

In a task of such huge dimensions there are bound to be weaknesses. The chief criticism has been the fact that in some places where several species occurred in large numbers whose seasonal histories do not coincide, collections made late in the summer do not show a representative number of the adults of the earlier species. To be more accurate in this respect, collections should be made several times between July 1 and September 1. Another weakness has been the fact that a few of the important species are more agile than are the collectors. Dissosteira longipennis Thos. does not appear in the collections in numbers representative of its abundance in the areas where it was the dominant species. Notwithstanding these weaknesses, it is believed that these data will have their place in a study of the grasshopper populations.

All of the 24 States located west of and including Michigan, Illinois, Missouri, Arkansas, and Texas experienced light to very severe infestations of grasshoppers during the summer. The most severe and widespread damage was done to small grains in eight counties in the northeastern quarter of South Dakota and to crop and range grasses in the entire southeastern quarter of Colorado. Severe damage was done to cotton in Texas and Oklahoma and spotted but severe injury occurred in corn, alfalfa, and small grains in other States. Over the entire area the total crop loss was estimated as being between one-half and one-third of the loss in 1936. Outside of this area, Indiana, Tennessee, Alabama, Mississippi, Florida, and other States reported either increased numbers of grasshoppers or minor outbreaks.

In the great wheat areas of the Plains States Melanoplus mexicanus Sauss. was by far the most important species. In areas of greater rainfall, such as the Corn Belt, where farming is more diversified, other species such as M. differentialis Thos., M. bivittatus Say, and M. femur-rubrum Deg., equaled or outnumbered M. mexicanus in many places. Camnula pellucida Scudd. was dominant in northern Michigan and Wisconsin and in parts of Oregon and California. In many parts of the area M. packardii Scudd. was also recorded as being numerous and important. M. differentialis was dominant, for the first time in history, in a part of Montana, namely, in Richland County, in the eastern part of the State. Before 1932 there had been no record of this species in the State. It spread from the southwestern quarter of North Dakota, east of the Badlands, where it was numerous in 1931, 1932, and 1933, and appeared for the first time near Glendive, Mont.

Another important feature of the outbreaks, during the last 4 years, was the increase in numbers and importance of Melanoplus femur-rubrum in practically all of the States and the development of a specific area of this species embracing north-central and northeastern Iowa, south-central and southeastern Minnesota, the southern half of Wisconsin, and part of northern Illinois. The most spectacular and publicized affair was the great outbreak of Dissosteira longipennis, which included all of southeastern Colorado, the extreme western part of Kansas, the Panhandle of Oklahoma, the northwestern counties of the Panhandle of Texas, and the extreme northeastern counties of New Mexico.

There was some hatching of Melanoplus mexicanus and M. bivittatus before May 1 and in southern Arizona as early as February 15. In many localities spring rains and cool weather delayed hatching from 2 to 3 weeks. Melanoplus differentialis and M. femur-rubrum were from 2 to 3 weeks later in hatching than were M. mexicanus and M. bivittatus. Over the entire area there were many places where the hatching of fall eggs of several species was prolonged up to the middle of July and the first of August. Dissosteira longipennis in Colorado and elsewhere started hatching the second week in May. Late hatching of some species in parts of the area delayed the necessity of control work until the latter part of July. This was caused by cool, rainy weather throughout June and part of July. Ninety percent of the poisoned bait used in Minnesota was distributed after July 26. Over the entire area these early rains delayed grasshopper activity.

A nymphal survey in May and June showed newly hatched nymphs to be congregated in restricted areas. On the range in Colorado the third week of May Dissosteira longipennis was observed in bands covering from 40 to 320 acres, and from 50 to 500 per square foot. These were in the first instar and were already migrating and spreading. If scattered over from 10 to 100 times their original hatching areas the population would still have been 50 per square yard, which is a very heavy infestation. One concentrated band observed at this time, if spread over an area of 50 square miles, would have populated it at the rate of 50 per square yard.

In the last week of May heavy concentrations of Melanoplus mexicanus and M. bivittatus occurred in alfalfa, pasture, draws, creek bottoms, stubble, and field margins. Some of these concentrations ranged from 300 to 500 hoppers per square yard. At that time there had been no general movement of these species to other crops from the breeding grounds. In South Dakota only 1 out of 5 to 10 fields near Huron was at first involved, because the infestations were spotted.

Well-tilled fields were at first free of hoppers. These spotted, very dense infestations spread over a wide territory adjacent to their original hatching ground. One quarter section of seedling alfalfa in this area had a population of 250 per square yard over the entire field. These hoppers could have consumed all of the grain in 8 or 10 sections.

In both the Huron and Winner areas of South Dakota many of the grassy headlands suitable for egg deposition of Melanoplus differentialis and M. bivittatus had been covered by blown soil and changed to hummocks of sandy loam covered with Russian-thistle. This condition was well suited for the egg deposition of M. mexicanus and in these places this species hatched in considerable numbers. An environmental factor suitable to certain species had been changed to one suitable for another. The fact that grasshoppers are important factors in soil blowing in South Dakota is now generally recognized. Most of the grainfields destroyed in the eight counties in South Dakota started blowing as soon as the hoppers had taken off the grain.

There was a period of cold, rainy weather during the first 3 weeks of June. This retarded the nymphal development, and in northern Iowa, northern Montana, northern and northeastern Wyoming, and elsewhere destroyed from 25 to 50 percent of the newly hatched nymphs. It also delayed and seriously interfered with the baiting programs. Considerable bait was wasted by distribution under unfavorable conditions. For example, in one area farmers were spreading bait at 4 a.m., when the air temperature did not reach 70° F. until 10 or 11 a.m. This allowed the bait to dry out before the hoppers were ready to eat it. During such unfavorable conditions for baiting, there is still a gradual spread from the hatching areas without the opportunity to check it. Prolonged hatching aggravates the situation by increasing the number of bait applications necessary and adds a discouraging note to the whole program. In some instances first-instar individuals of Melanoplus mexicanus were found together in the same field with the gravid females.

The first record of adults was received from southwestern Oklahoma where 50 percent of Melanoplus mexicanus were adult by May 22. Oviposition by this species started July 1 and a second generation began hatching July 20, with adults appearing again by September 1. Egg deposition by this second generation began on September 20 and continued into November. In many localities in South Dakota, Nebraska, Kansas, Oklahoma, Missouri, Iowa, and other States this second generation occurred in numbers of 15 to 100 per square yard in alfalfa, stubble, and along field margins. These infestations actually developed into secondary outbreaks being especially injurious to newly sown winter wheat and necessitating control measures to protect crops. The State of Nebraska, recognizing this condition and desiring to protect crops from this second generation, went so far as to add 25 percent to the quantity of bait estimated from the fall egg survey as needed for control in 1938.

By June 20 a few adults of Melanoplus bivittatus were present, together with all instars. At this time M. differentialis and M. femur-rubrum were still in the first three instars. Melanoplus bivittatus started ovipositing after July 15 and M. differentialis about September 1. From then on until the middle of November, there was an almost continuously favorable period for egg deposition in most of the infested region. There was also plenty of green food for the development of eggs within the females.

During the summer there were fewer flights recorded than in 1936, which was probably due to the cooler weather and better food conditions. In the Dissosteira longipennis areas this species was migrating by foot or wing from hatching time until the females had settled down to egg deposition. Some 3 or 4 million acres were involved in Colorado alone. Melanoplus mexicanus spread over 33 counties east of the Missouri River in South Dakota from the 8 counties in the northeastern quarter and from local infestations; however, for the most part, migrations were from breeding grounds to adjacent crops.

Generally speaking, disease, parasites, and egg predators apparently did not reduce populations to any great degree during the summer. In some areas sarcophagid flies were a minor factor. During the egg survey bee fly, blister beetle, and carabid larvae were numerous, with from 40 to 70 percent of the egg pods attacked in some places in Missouri, Iowa, and Minnesota. Fungus disease occurred only occasionally.

Eggs of all species were, in general, easily found and well distributed over the entire region. In a few States, including Montana, Wyoming, Illinois, Kansas, and Nebraska, infestations are equal to or somewhat less than last year (1936). In many of the other States infestations are more widespread and more severe than they have been for several years. They increased in northern Michigan, all of Wisconsin, and in the southern half of Minnesota. The most severe infestations were found in Iowa, northern Missouri, and east of the Missouri River in North Dakota and South Dakota. Egg pods of Melanoplus differentialis ranged from 25 to 100 per square foot in many places in Iowa and Missouri. Other species were also numerous. One of the most startling facts was the finding of egg pods, mostly M. mexicanus, at each of 266 stops made in 33 counties east of the Missouri River in South Dakota. At 264 of these, 5 square-foot samples were taken from within each field, or a total of 1,320 square-foot samples. Egg pods were found in 1,238 of them, or in 15 out of 16 square-foot samples. In southern Wisconsin egg pods of Melanoplus femur-rubrum ranged from 4 or 5 per square foot in upland pastures to 6 or 8 in the bottom lands.

Infestations increased in the delta section of Arkansas, over most of Oklahoma, and in from 60 to 80 counties in northwestern, northern, and central Texas. In northeastern New Mexico there were 400 or 500 egg beds of Dissosteira longipennis from 4 to 10 acres in size, with from 8 to 30 pods per square foot. The average infestation in Arizona was about the same as in 1936, although there were shifts within the State.

In Colorado D. longipennis commanded the most interest. In the spring of 1937 it was estimated that 3,400,000 acres was infested at hatching time in 8 southeastern counties, whereas in the fall it was estimated that there were 4,025,760 acres of breeding areas in 12 counties, only 4 of which contained egg beds in the spring. Eight new counties became infested by D. longipennis during the season, while four of the counties having infestations last year were not included in the area in which egg beds were found in the fall. Owing to the great migrations of adults the infested area was almost directly west of where D. longipennis hatched the previous spring. Other species were also abundant in the irrigated sections of the State.

The adult survey indicated that there would be some outbreaks in Idaho, Utah, and Washington in 1938. Grasshoppers were also on the increase in widely separated parts of Oregon threatening serious damage in 1938.

The Nymphal Survey in 1938

The nymphal survey in the spring of 1938 more than bore out the predictions made from the adult and egg surveys in 1937. Enormous numbers of Melanoplus mexicanus hatched out in stubble, peppergrass prairie, and in idle or reverted lands in the Dakotas. From 1,000 to 8,000 per square yard were present in many places. Dissosteira longipennis first appeared in numbers as great as 10,000 per square yard. Generally speaking, rains and inclement weather delayed and prolonged hatching over the entire area.

The enormous number of eggs deposited during the fall was due to the prolonged favorable period for egg deposition. In the areas infested by Melanoplus mexicanus and M. differentialis the rainfall for the months of September, October, November, and December was about 50 percent of normal, and the favorable fall conditions permitted an unusual population increase through the development of a second generation, hatching late in July and in August, which reached maturity and deposited eggs. The first nymphs of the second generation were observed on July 20 and favorable oviposition weather continued until November 15, a period of approximately 130 days. This was ample time for the second generation to mature and oviposit, as is shown by the following record of a female M. mexicanus reared at room temperatures. The total span of life for this female was 108 days, 36 of which were required for nymphal development, 37 days from last molt to deposition of first egg pod, and 35 days from first to last egg pod deposited, in which period 10 pods containing a total of 197 eggs were laid.

In addition to the following detailed tabulations of the collections by States, a list is given for each State showing the five species indicated by these collections to be the most important in each habitat.

ARIZONA

Of the 1,020 specimens collected Melanoplus mexicanus was the most numerous and M. femur-rubrum was second. This is not a large enough collection to be representative of the relative numbers of the different species occurring in the State. Although there was a more general distribution of grasshoppers reported in the agricultural counties than in any previous year, the infestations were not severe or extensive.

Distribution by species of 1,020 specimens collected in Arizona, expressed in percentage of total number collected in each habitat

Species	Small grains	Legumes	Road-side	Range	Environment not shown	Weedy patches	Miscellaneous	Total specimens	Percentage of grand total
								Number	
Aulocara elliotti Thos.	--	--	--	--	2.33	--	--	2	0.20
Ageneotettix deorum Scudd.	--	--	--	--	--	--	1.49	1	0.10
Brachystola sp.	--	0.19	--	--	--	--	--	1	0.10
Camnula pellucida Scudd.	--	0.75	--	10.20	--	--	--	9	0.88
Conozoa carinata Rehn.	--	1.12	8.57	--	9.30	--	--	17	1.67
Cordillacris crenulata Brun.	--	--	--	--	--	--	2.99	2	0.20
Dissosteira carolina L.	--	--	2.86	--	2.33	--	5.97	7	0.69
Melanoplus bivittatus Say	--	2.62	--	--	5.81	--	--	19	1.86
Melanoplus differentialis Thos.	1.11	1.87	5.71	--	1.16	0.63	--	15	1.47
Melanoplus femur-rubrum Deg.	4.44	3.92	37.14	4.08	24.42	34.18	--	115	11.27
Melanoplus gladstoni Scudd.	2.22	1.68	--	--	--	--	--	11	1.08
Melanoplus lakinus Scudd.	18.39	0.75	--	--	--	--	--	21	2.06
Melanoplus mexicanus Sauss.	1.11	16.26	45.71	4.08	31.39	--	--	133	13.03
Melanoplus occidentalis Thos.	--	3.92	--	--	3.49	--	1.49	25	2.45
Melanoplus packardii Scudd.	--	0.56	--	--	--	--	5.97	7	0.69
Melanoplus sp.	--	1.12	--	--	--	--	--	6	0.59
Melanoplus yarrowii Thos.	--	0.75	--	--	--	--	--	4	0.39
Mermiria sp.	--	--	--	--	--	1.90	--	3	0.29
Opeia obscura Thos.	--	0.19	--	79.59	--	0.63	--	41	4.02
Opeia testacea Scudd.	--	1.31	--	--	--	--	--	7	0.69
Orphulella compta Scudd.	--	2.24	--	--	--	--	--	12	1.18
Psoloessa delicatula Scudd.	--	--	--	--	2.33	--	--	2	0.20
Schistocerca shoshone Thos.	1.11	--	--	--	--	--	--	1	0.10
Trachyrhachis kiowa Thos.	--	0.56	--	--	1.16	--	8.96	10	0.98
Trimerotropis pallidipennis Burm.	1.11	0.19	--	--	1.16	--	11.94	11	1.08
Xanthippus corallipes Hald.	--	0.56	--	2.05	2.33	--	--	6	0.59
Adults undetermined	6.67	--	--	--	6.98	5.70	--	21	2.06
Nymphs undetermined	63.33	59.43	--	--	5.81	56.96	61.19	511	50.08
Total specimens per environment	90	535	35	49	86	158	67	1,020	--

ARIZONA

Small grains

		Percent
1.	Melanoplus lakinus	19
2.	Melanoplus femur-rubrum	4
3.	Melanoplus gladstoni	2
4.	Melanoplus differentialis	1
5.	Melanoplus mexicanus	1
6.	Four other species	73

Undetermined adults, 7
Nymphs, 63

Legumes

1.	Melanoplus mexicanus	16
2.	Melanoplus femur-rubrum	4
3.	Melanoplus occidentalis	4
4.	Melanoplus bivittatus	3
5.	Orphulella compta	2
6.	Fifteen other species	71

Undetermined adults, none.
Nymphs, 59

Roadside

1.	Melanoplus mexicanus	46
2.	Melanoplus femur-rubrum	37
3.	Conozoa carinata	9
4.	Melanoplus differentialis	6
5.	Dissosteira carolina	2

Range

1.	Cannula pellucida	10
2.	Melanoplus femur-rubrum	4
3.	Melanoplus mexicanus	4
4.	Xanthippus corallipes	2

Nymphs, 30

Environment not shown

1.	Melanoplus mexicanus	31
2.	Melanoplus femur-rubrum	24
3.	Conozoa carinata	9
4.	Melanoplus bivittatus	6
5.	Melanoplus occidentalis	3
6.	Nine other species	27

Undetermined adults, 2
Nymphs, 6

Weedy patches

		Percent
1.	Melanoplus femur-rubrum	34
2.	Mermiria sp.	2
3.	Four other species	64

Undetermined adults, 5
Nymphs, 56

Miscellaneous

1.	Trimerotropis pallidipennis	12
2.	Trachyrhachis kiowa	9
3.	Dissosteira carolina L.	6
4.	Melanoplus packardii	6
5.	Cord. cremulata	3
6.	Other species	64

Nymphs, 61

Percentage of grand total

1.	Melanoplus mexicanus	13
2.	Melanoplus femur-rubrum	11
3.	Opeia obscura	4
4.	Melanoplus occidentalis	2
5.	Melanoplus lakinus	2
6.	Twenty-three other species	68

Undetermined, 2
Nymphs, 50

ARKANSAS

Only 587 specimens were collected in Arkansas during the adult survey. Of these M. mexicanus was most numerous, with M. differentialis second and M. femur-rubrum third. Seven counties in the northeastern part of the State constituted the only area included in the survey. In this area cotton, corn, and alfalfa were the most seriously damaged and soybeans were generally infested.

Distribution by species of 587 specimens collected in Arkansas, expressed in percentage of total number collected in each habitat

Species	Small grain	Corn	Lagunes	Grassland	Environment not shown	Total specimens: Number	Percentage of grand total
Dissosteira carolina L.	0.49	--	0.46	4.90	--	7	1.19
Dichromorpha viridis Scudd.	0.49	--	--	--	--	1	0.17
Hippiscus rugosus Scudd.	--	5.41	--	--	--	2	.0.34
Orphulella pelidna Burm.	--	--	--	--	64.00	16	2.72
Melanoplus differentialis Thos.	21.56	32.43	20.09	9.80	--	110	18.73
Melanoplus femur-rubrum Deg.	10.29	2.70	24.20	20.59	4.00	97	16.52
Melanoplus mexicanus Sauss.	43.13	5.41	39.27	34.31	4.00	212	36.10
Syrbula admirabilis Uhler	--	--	--	--	23.00	7	1.19
Nymphs	24.01	21.62	15.98	28.43	--	121	20.61
Undetermined	--	32.43	--	1.96	--	14	2.38
Total specimens per environment	204	37	219	102	25	587	--

ARKANSAS

Small grains

		Percent
1.	Melanoplus mexicanus	43
2.	Melanoplus differentialis	22
3.	Melanoplus femur-rubrum	10
4.	Dissosteira carolina	0.49*
5.	Dichromorpha viridis	0.49*
6.	One other species	24
	Undetermined adults, 6	
	Nymphs, 24	

Grassland

		Percent
1.	Melanoplus mexicanus	34
2.	Melanoplus femur-rubrum	21
3.	Melanoplus differentialis	10
4.	Dissosteira carolina	5
5.	Two other species	30
	Undetermined adults, 2	
	Nymphs, 28	

Corn

1.	Melanoplus differentialis	32
2.	Hippiscus rugosus	5
3.	Melanoplus mexicanus	5
4.	Melanoplus femur-rubrum	3
5.	Two other species	54
	Undetermined adults, 32	
	Nymphs, 22	

Environment not shown

1.	Orphulella pelidna	64
2.	Syrbula admirabilis	28
3.	Melanoplus femur-rubrum	4
4.	Melanoplus mexicanus	4
	Undetermined adults, 0	
	Nymphs, 0	

Legumes

1.	Melanoplus mexicanus	39
2.	Melanoplus femur-rubrum	24
3.	Melanoplus differentialis	20
4.	Dissosteira carolina	0.46**
5.	One other species	16
	Undetermined adults, 0	
	Nymphs, 16	

Percentage of grand total

1.	Melanoplus mexicanus	36
2.	Melanoplus differentialis	19
3.	Melanoplus femur-rubrum	17
4.	Orphulella pelidna	3
5.	Dissosteira carolina	1
6.	Five other species	24
	Undetermined adults, 3	
	Nymphs, 21	

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* These two species equal 1.

** Taken as 1.

COLORADO

Other than Dissosteira longipennis on the rangelands in the southeastern quarter of the State, M. mexicanus and M. bivittatus were the most important species. In the total collection of 18,078 specimens for the State, D. longipennis does not show up in its true importance. This is due to the difficulty with which adults of this species are taken by the general method for collecting practiced in the survey. Therefore the table for the important species on the range must be considered as applying to species other than D. longipennis. Melanoplus bivittatus seems to have increased in relative numbers since 1935.

Distribution by species of 18,078 specimens collected in Colorado, expressed in percentage of total number collected in each habitat

Species	Alfalfa	Pasture	Corn	Roadside	Range	Sorghums	Beets	Beans	Small grains	Potatoes	Total specimens	Percentage of grand total
											Number	
Acrolophitus hirtipes Say	--	0.03	0.04	--	0.06	--	--	--	--	--	4	0.02
Aeoloplus turnbulli Thos.	1.15	3.72	6.33	9.57	4.66	8.03	10.47	--	7.92	30.95	903	4.99
Aeropedellus clavatus Thos.	--	--	--	--	0.08	--	--	--	--	--	3	0.02
Ageneotettix deorum Scudd.	0.22	1.43	0.63	0.60	4.22	--	--	--	0.62	--	240	1.32
Amphitornus coloradus Thos.	--	0.20	0.13	--	2.89	--	--	--	0.62	--	115	0.63
Anabrus simplex Hald.	--	0.31	--	--	--	--	--	--	--	--	7	0.04
Arphia pseudonietana Thos.	--	0.03	0.04	--	--	--	--	--	0.21	--	3	0.02
Aulocara elliotti Thos.	0.22	2.18	0.27	0.93	8.01	0.51	--	--	1.25	--	407	2.24
Boopedon nubilum Say	--	0.39	--	--	0.25	--	--	--	--	--	21	0.12
Brachystola magna Gir.	0.05	0.78	0.31	0.75	0.03	0.17	--	--	--	--	60	0.33
Camnula pellucida Scudd.	0.22	--	0.09	--	0.03	--	--	--	--	--	12	0.07
Cherthippus longicornis Latr.	--	--	0.04	--	--	--	--	--	--	--	1	0.01
Cordillacris crenulata Brun.	--	0.33	0.04	--	12.22	--	--	--	--	--	446	2.45
Cordillacris occipitalis Thos.	--	0.26	0.09	0.06	1.21	--	--	--	--	--	55	0.30
Dactylotum pictum Thos.	--	0.13	--	--	0.06	--	--	--	--	--	6	0.03
Derotmema haydenii Thos.	0.14	1.47	0.54	1.08	1.74	2.73	--	--	1.04	--	182	1.00
Dissosteira carolina L.	0.12	0.26	0.40	0.81	0.22	1.20	0.95	0.23	--	--	67	0.37
Dissosteira longipennis Thos.	8.30	19.56	1.03	0.21	3.85	0.17	--	--	--	--	1,114	6.13
Drepanopterna femoratum Scudd.	0.02	0.36	0.13	0.15	2.53	--	--	--	0.42	--	112	0.62
Ercoptolophus sordidus costalis Scudd.	0.05	0.07	--	--	0.08	--	--	--	2.92	--	21	0.12
Hadrotettix trifasciatus Say	0.02	0.52	0.04	0.15	0.73	0.34	--	--	0.42	--	53	0.29
Hesperotettix speciosus Scudd.	--	0.82	0.81	1.98	0.48	0.17	--	--	0.21	--	128	0.70
Hesperotettix viridis Thos.	0.02	1.24	0.13	--	0.23	--	--	--	1.04	--	57	0.31
Hippiscus rugosus Scudd.	--	0.03	--	--	0.03	--	--	--	--	--	2	0.01
Hypochlora alba Dodge	--	0.03	--	--	--	--	--	--	--	--	1	0.01
Melanoplus angustipennis Dodge	1.99	6.42	3.95	5.34	5.25	4.79	3.33	2.52	0.83	4.76	785	4.32
Melanoplus arizonae Scudd.	--	0.13	--	--	--	--	--	--	--	--	4	0.02
Melanoplus bivittatus Say	24.91	4.60	15.85	8.16	0.28	11.79	14.76	25.91	9.17	14.29	2,077	11.42
Melanoplus bowditchi Scudd.	0.02	8.51	0.40	1.29	3.60	--	--	--	--	--	442	2.43
Melanoplus confusus Scudd.	--	--	--	--	0.03	--	--	--	--	--	1	0.01
Melanoplus differentialis Thos.	8.21	1.34	6.60	3.93	0.08	5.13	15.71	14.90	4.17	14.29	818	4.50

Distribution by species of 18,078 specimens collected in Colorado, expressed in percentage of total number collected in each habitat--Continued

Species	Alfalfa	Pasture	Corn	Roadside	Range	Sorghums	Beets	Beans	Small grains	Potatoes	Total specimens	Percentage of grand total
											Number	
Melanoplus femur-rubrum Deg.	19.58	3.19	2.65	7.11	0.06	2.39	14.28	16.05	20.21	4.76	1,425	7.84
Melanoplus flavidus flavidus Scudd.	0.34	1.99	2.07	3.42	1.04	0.85	--	0.46	0.42	--	281	1.55
Melanoplus foedus Scudd.	2.38	8.80	19.31	18.63	4.55	15.04	0.95	8.94	6.25	9.52	1,745	9.60
Melanoplus gladstoni Scudd.	0.05	0.23	0.36	0.18	0.42	--	--	--	--	--	38	0.21
Melanoplus infantilis Scudd.	--	0.10	--	--	0.48	--	--	--	--	--	20	0.11
Melanoplus keeleri luridus Dodge	--	--	--	--	0.06	--	--	--	--	--	2	0.01
Melanoplus lakinus Scudd.	8.71	2.80	7.23	4.77	1.74	11.79	10.47	15.59	10.62	11.90	1,046	5.75
Melanoplus mexicanus Sauss.	7.61	7.56	20.25	13.80	4.66	25.98	3.33	13.53	18.33	9.52	1,936	10.65
Melanoplus occidentalis Thos.	0.07	1.66	0.27	0.93	2.81	--	--	--	--	--	191	1.05
Melanoplus packardii Scudd.	1.03	5.38	4.80	5.61	2.05	3.93	0.95	0.69	4.17	--	623	3.43
Melanoplus regalis Dodge	--	0.03	--	--	0.14	--	--	--	--	--	6	0.03
Mermiria maculipennis Brun.	0.05	3.00	0.49	0.48	0.62	0.51	--	--	1.25	--	152	0.84
Mermiria neomexicana Thos.	--	0.13	--	--	--	--	--	--	--	--	4	0.02
Metator pardalinus Sauss.	0.05	0.46	0.04	0.33	2.61	0.17	--	--	--	--	122	0.67
Opeia obscura Thos.	--	0.33	0.04	--	1.21	--	--	--	--	--	54	0.30
Orphulella pelidna Burm.	--	0.10	--	--	--	--	--	--	--	--	3	0.02
Pardalophora haldemanii Scudd.	--	--	0.04	--	--	--	--	--	--	--	1	0.01
Paropomala wyomingensis Thos.	--	1.73	0.04	0.06	0.34	--	--	--	--	--	68	0.37
Phlibostroma quadrimaculatum Thos.	--	0.98	0.40	0.15	7.67	--	--	--	--	--	317	1.74
Phoetaliotes nebrascensis Thos.	--	1.47	0.36	0.15	0.11	0.34	--	--	--	--	64	0.35
Psoloessa delicatula delicatula Scudd.	--	--	--	--	0.06	--	--	--	--	--	2	0.01
Spharagemon collare Scudd.	0.86	1.86	1.08	0.66	1.41	1.20	--	0.69	0.42	--	201	1.11
Spharagemon equale Say	--	1.37	0.13	0.36	0.22	1.03	--	0.23	--	--	72	0.40
Trachyrhachis kiowa Thos.	0.02	0.49	0.04	0.06	3.26	--	--	--	0.21	--	136	0.75
Trimerotropis agrestis McNeill	--	0.03	--	0.06	--	--	--	--	--	--	3	0.02
Trimerotropis laticincta Sauss.	--	0.85	0.58	0.60	5.40	0.85	--	0.23	0.21	--	258	1.42
Trimerotropis pallidipennis Burm.	0.02	0.03	--	0.45	--	0.34	--	--	--	--	19	0.10
Tropidolophus formosus Say	--	--	--	--	0.08	--	--	--	--	--	3	0.02
Nymphs	13.49	0.52	1.48	6.87	5.76	0.51	24.76	--	7.08	--	1,134	6.24
Total specimens per environment	4,164	3,065	2,226	3,323	3,547	585	210	436	480	42	18,078	--

COLORADO

Alfalfa

		Percent
1.	Melanoplus bivittatus	25
2.	Melanoplus femur-rubrum	20
3.	Melanoplus lakinus	9
4.	Dissosteira longipennis	8
5.	Melanoplus differentialis	8
6.	Twenty-four other species	30
	Nymphs, 13.49	

Pasture

1.	Dissosteira longipennis	20
2.	Melanoplus foedus	9
3.	Melanoplus bowditchi	9
4.	Melanoplus mexicanus	8
5.	Melanoplus angustipennis	6
6.	Forty-six other species	48
	Nymphs, 0.52	

Corn

1.	Melanoplus mexicanus	20
2.	Melanoplus foedus	19
3.	Melanoplus bivittatus	16
4.	Melanoplus lakinus	7
5.	Aeoloplus turnbulli	6
6.	Thirty-six other species	32
	Nymphs, 1.48	

Roadside

1.	Melanoplus foedus	19
2.	Melanoplus mexicanus	14
3.	Aeoloplus turnbulli	10
4.	Melanoplus bivittatus	8
5.	Melanoplus femur-rubrum	7
6.	Twenty-nine other species	42
	Nymphs, 6.87	

Range*

1.	Cordillacris crenulata	12
2.	Aulocara elliotti	8
3.	Phlibostroma quadrimaculatum	8
4.	Trimerotropis laticincta	5
5.	Melanoplus angustipennis	5
6.	Forty-four other species	62
	Nymphs, 5.76	

Sorghums

		Percent
1.	Melanoplus mexicanus	26
2.	Melanoplus foedus	15
3.	Melanoplus bivittatus	12
4.	Melanoplus lakinus	12
5.	Aeoloplus turnbulli	8
6.	Nineteen other species	27
	Nymphs, 0.51	

Beets

1.	Melanoplus differentialis	16
2.	Melanoplus bivittatus	15
3.	Melanoplus femur-rubrum	14
4.	Aeoloplus turnbulli	10
5.	Melanoplus lakinus	10
6.	Five other species	35
	Nymphs, 24.76	

Beans

1.	Melanoplus bivittatus	26
2.	Melanoplus femur-rubrum	16
3.	Melanoplus lakinus	16
4.	Melanoplus differentialis	15
5.	Melanoplus mexicanus	14
6.	Eight other species	13
	Nymphs, 0	

Small grains

1.	Melanoplus femur-rubrum	20
2.	Melanoplus mexicanus	18
3.	Melanoplus lakinus	11
4.	Melanoplus bivittatus	9
5.	Aeoloplus turnbulli	8
6.	Nineteen other species	34
	Nymphs, 7.08	

Potatoes

1.	Aeoloplus turnbulli	31
2.	Melanoplus bivittatus	14
3.	Melanoplus differentialis	14
4.	Melanoplus lakinus	12
5.	Melanoplus mexicanus	10
6.	Three other species	19
	Nymphs, 0	

*Other than Dissosteira longipennis

COLORADO Continued

Percentage of grand total

1. Melanoplus bivittatus ---------- 11
2. Melanoplus mexicanus ---------- 11
3. Melanoplus foedus ---------- 10
4. Melanoplus femur-rubrum ------- 8
5. Dissosteira longipennis ------- 6
6. Fifty-four other species ------ 54

Nymphs, 6.24

IOWA

In Iowa 14,607 specimens were collected. The most important species from the standpoint of relative numbers was M. femur-rubrum, with M. mexicanus second, M. differentialis third, and M. bivittatus fourth. A great number of nymphs made up the collections and these were not determined. Most of them were probably the second generation of M. mexicanus.

From infestations limited to 27 counties in the western third of the State in 1935, populations built up to outbreak numbers in all counties of the State in 1937. Heavy rains in the spring of 1938 delayed hatching and it is probable that the populations have been reduced, although this has not been determined with any degree of accuracy.

The preponderant species in this State were M. differentialis in the southern and southwestern parts; M. mexicanus and M. bivittatus in the western and northwestern parts; and M. femur-rubrum in the northern, east-central, and northeastern parts.

Distribution by species of 14,607 specimens collected in Iowa, expressed in percentage of total number collected in each habitat

Species	Legumes	Roadside	Pasture	Small grains	River bottom	Weeds	Range	Environment not given	Corn	Fencerow	Total specimens	Percentage of grand total
											Number	
Acrolophitus hirtipes Say	--	--	0.02	--	--	--	--	--	--	--	1	0.01
Aeoloplus turnbullii bruneri Caud	--	--	0.32	--	--	--	--	--	--	--	13	0.09
Aeropedellus clavatus Thos.	--	--	--	--	--	--	4.06	--	--	--	19	0.13
Ageneotettix deorum Scudd.	1.44	1.31	3.78	1.55	--	0.83	13.46	--	5.77	1.45	345	2.36
Arphia pseudonietana Thos.	--	--	0.02	--	--	--	0.64	--	--	--	4	0.03
Aulocara elliotti Thos.	--	--	0.30	0.13	--	--	2.14	3.80	--	--	44	0.30
Chorthippus longicornis Latr.	--	--	0.02	--	2.58	--	--	--	--	--	15	0.10
Cordillacris occipitalis Thos.	--	--	--	--	--	--	3.84	--	--	--	18	0.12
Derotmema haydenii Thos.	0.02	--	--	--	--	--	--	--	--	--	1	0.01
Dichromorpha viridis Scudd.	--	0.06	0.05	--	--	--	--	--	--	--	3	0.02
Dissosteira carolina L.	0.18	1.42	0.50	0.13	0.37	--	--	--	--	0.29	59	0.40
Encoptolophus sordidus costalis Scudd.	0.23	--	--	--	--	--	--	--	--	--	4	0.03
Encoptolophus sordidus sordidus Burm.	0.06	0.23	0.12	0.07	--	--	0.64	--	--	--	16	0.11
Hadrotettix trifasciatus Say	--	--	0.05	--	--	--	--	--	--	--	2	0.01
Hesperotettix viridis Thos.	--	--	0.10	--	--	--	0.21	--	--	--	5	0.03
Hippiscus rugosus Scudd.	--	0.06	0.32	--	0.19	--	0.43	--	1.92	0.29	19	0.13
Melanoplus bivittatus Say	4.69	12.06	0.67	3.43	2.95	2.75	--	--	3.85	20.29	626	4.28
Melanoplus confusus Scudd.	--	--	0.05	--	--	--	1.28	--	--	--	8	0.05
Melanoplus differentialis Thos.	4.16	7.45	2.04	2.83	10.86	1.38	1.71	--	30.77	37.67	684	4.68
Melanoplus femur-rubrum Deg.	33.86	52.35	40.54	36.01	46.39	--	3.84	--	23.08	10.72	5,121	35.03
Melanoplus gladstoni Scudd.	0.28	--	--	0.07	--	--	0.21	--	--	--	16	0.11
Melanoplus keeleri luridus Dodge	0.02	--	0.02	--	--	--	2.35	--	--	--	13	0.09
Melanoplus mexicanus Sauss.	13.38	10.30	17.16	10.30	3.68	3.03	7.05	1.14	5.77	7.82	1,802	12.33
Melanoplus occidentalis Thos.	--	--	--	0.07	--	0.83	9.18	3.42	--	--	65	0.44
Melanoplus packardii Scudd.	0.24	0.46	0.15	--	--	0.55	--	--	--	--	28	0.19
Mestobregma plattei Thos.	--	0.06	--	--	--	--	--	--	--	--	1	0.01
Orphulella pelidna Burm.	0.08	0.60	3.09	0.30	--	--	0.85	--	--	0.29	147	1.01
Orphulella speciosa Scudd.	--	--	0.37	0.07	--	--	4.91	--	--	--	39	0.27
Phoetaliotes nebrascensis Thos.	--	0.17	0.10	0.40	--	--	6.84	--	--	--	45	0.31
Schistocerca lineata Scudd.	0.02	--	--	--	--	--	--	--	--	--	1	0.01
Spharagemon collare Scudd.	0.02	--	--	--	--	--	--	--	--	--	1	0.01
Spharagemon equale Say	0.02	--	--	0.07	--	--	--	--	--	--	2	0.01
Syrbula admirabilis Uhl.	--	--	0.07	--	--	--	--	--	--	--	3	0.02
Trachyrhachis kiowa Thos.	0.18	--	0.07	--	--	--	0.21	--	--	--	13	0.09
Nymphs	41.04	13.14	29.93	44.49	32.95	90.61	36.10	91.63	28.85	21.16	5,424	37.10
Total specimens per environment	5,059	1,755	4,012	1,484	543	363	468	526	52	345	14,607	--

IOWA

Legumes

		Percent
1.	Melanoplus femur-rubrum	34
2.	Melanoplus mexicanus	13
3.	Melanoplus bivittatus	5
4.	Melanoplus differentialis	4
5.	Ageneotettix deorum	1
6.	Eleven other species	43

Nymphs, 41.04

Woods

		Percent
1.	Melanoplus mexicanus	3
2.	Melanoplus bivittatus	3
3.	Melanoplus differentialis	1
4.	Ageneotettix deorum	1
5.	Melanoplus occidentalis	1
6.	One other species	91

Nymphs, 90.61

Roadside

1.	Melanoplus femur-rubrum	52
2.	Melanoplus bivittatus	12
3.	Melanoplus mexicanus	10
4.	Melanoplus differentialis	7
5.	Dissosteira carolina	1
6.	Nine other species	18

Nymphs, 13.14

Range

1.	Ageneotettix deorum	13
2.	Melanoplus occidentalis	9
3.	Melanoplus mexicanus	7
4.	Phoetaliotes nebrascensis	7
5.	Orphulella speciosa	5
6.	Fourteen other species	59

Nymphs, 36.10

Pasture

1.	Melanoplus femur-rubrum	41
2.	Melanoplus mexicanus	17
3.	Ageneotettix deorum	4
4.	Orphulella pelidna	3
5.	Melanoplus differentialis	2
6.	Nineteen other species	33

Nymphs, 29.93

Environment not given

1.	Aulocara elliotti	4
2.	Melanoplus occidentalis	3
3.	Melanoplus mexicanus	1
4.	Other species	92

Nymphs, 91.63

Small grains

1.	Melanoplus femur-rubrum	36
2.	Melanoplus mexicanus	10
3.	Melanoplus bivittatus	3
4.	Melanoplus differentialis	3
5.	Ageneotettix deorum	2
6.	Nine other species	46

Nymphs, 44.49

Corn

1.	Melanoplus differentialis	31
2.	Melanoplus femur-rubrum	23
3.	Ageneotettix deorum	6
4.	Melanoplus mexicanus	6
5.	Melanoplus bivittatus	4
6.	One other species	30

Nymphs, 28.85

River bottom

1.	Melanoplus femur-rubrum	46
2.	Melanoplus differentialis	11
3.	Melanoplus mexicanus	4
4.	Melanoplus bivittatus	3
5.	Chorthippus longicornis	3
6.	Two other species	33

Nymphs, 32.95

Fence row

1.	Melanoplus differentialis	38
2.	Melanoplus bivittatus	20
3.	Melanoplus femur-rubrum	11
4.	Melanoplus mexicanus	8
5.	Ageneotettix deorum	1
6.	Three other species	22

Nymphs, 21.16

Percentage of grand total

1. Melanoplus femur-rubrum ----- 35
2. Melanoplus mexicanus -------- 12
3. Melanoplus differentialis --- 5
4. Melanoplus bivittatus ------- 4
5. Ageneotettix deorum --------- 2
6. Twenty-nine other species --- 42

Nymphs, 37

KANSAS

Of the 9,492 specimens taken in Kansas, Melanoplus mexicanus was dominant with M. differentialis second in importance. The most severe infestations occurred in the north-central part of the State. There was a second generation of M. mexicanus. Egg deposition by this generation began about September 20 and continued until late in November.

Distribution by species, of 9,492 specimens collected in Kansas, expressed in percentage of total number collected in each habitat

Species	Small grains	Legumes	Pasture	Corn	Weedy patches	Windrows	Roadside	Creek bottom	Environment not shown	Range	Grassland	Total specimens	Percentage of grand total
												Number	
Aeoloplus turnbulli Thos.	1.67	0.09	0.90	--	4.88	3.28	8.77	0.33	0.97	1.91	--	142	1.49
Acrolophitus hirtipes Say	--	--	0.14	--	--	--	--	--	--	--	--	2	0.02
Ageneotettix deorum Scudd.	0.87	1.42	3.60	3.05	0.09	--	0.44	0.66	11.44	3.23	14.36	343	3.60
Amphitornus coloradus Thos.	--	--	--	--	--	--	--	--	--	--	0.19	1	0.01
Aulocara elliotti Thos.	1.74	0.09	1.80	--	0.19	--	0.44	0.33	2.27	12.18	0.39	173	1.82
Boopedon nubilum Say	--	--	0.14	--	--	--	0.44	0.66	--	--	2.14	16	0.17
Boopedon maculatum Caud.	0.06	--	0.07	9.61	--	--	--	--	--	--	--	3	0.03
Cordillacris occipitalis Thos.	--	--	--	--	--	--	--	--	--	0.73	--	5	0.05
Cordillacris crenulata Brun.	--	--	0.07	--	--	--	--	--	0.41	59.75	--	413	4.34
Derotmema haydenii Thos.	--	--	--	--	--	--	0.44	--	--	0.29	--	3	0.03
Dissosteira carolina L.	0.50	0.09	--	--	--	3.28	2.19	--	--	--	--	16	0.17
Dissosteira longipennis Thos	0.06	0.09	--	--	--	19.67	3.51	--	0.08	0.44	--	26	0.27
Drepanopterna femoratum Scudd.	0.06	--	--	--	--	--	--	--	--	3.33	--	24	0.25
Encoptolophus sordidus costalis Scudd.	0.12	--	--	--	--	--	--	--	--	--	--	2	0.02
Hadrotettix trifasciatus Say	--	0.14	0.14	--	--	--	--	--	--	0.88	--	11	0.12
Hesperotettix speciosus Scudd.	--	--	--	--	12.77	--	--	2.64	--	--	0.58	147	1.54
Hesperotettix viridis Thos.	--	--	0.14	1.22	--	--	--	--	--	--	--	4	0.04
Hippiscus rugosus Scudd.	0.06	--	0.42	--	--	--	--	--	--	--	0.97	12	0.13
Hypochlora alba Dodge	--	--	--	--	--	--	--	--	--	--	0.19	1	0.01
Melanoplus angustipennis Dodge	0.14	--	0.61	--	--	--	--	0.66	--	--	--	6	0.06
Melanoplus bivittatus Say	1.12	5.99	1.31	6.71	--	--	0.88	26.40	5.51	--	0.19	330	3.47
Melanoplus bispinosus Scudd.	--	0.37	--	--	--	--	--	--	0.24	--	--	11	0.12
Melanoplus confusus Scudd.	--	0.09	0.28	--	--	--	--	0.33	0.16	--	--	9	0.09
Melanoplus differentialis Thos.	4.03	8.77	0.21	14.02	--	--	0.44	10.56	8.11	--	--	416	4.37
Melanoplus flavidus Scudd.	--	0.23	--	--	--	--	--	--	--	--	--	5	0.05
Melanoplus foedus fluviatilis Brun.	0.06	0.55	--	0.61	--	--	--	--	--	--	--	14	0.15
Melanoplus femur-rubrum Deg.	0.81	0.96	0.07	7.32	--	--	--	1.98	0.49	--	3.30	76	0.80
Melanoplus foedus foedus Scudd.	--	0.09	--	--	--	--	0.88	--	--	0.15	--	5	0.05
Melanoplus infantilis Scudd.	--	--	--	--	--	--	--	--	0.08	--	--	1	0.01
Melanoplus impiger Scudd.	--	0.78	--	--	--	--	--	--	0.16	--	--	19	0.20

Distribution by species, of 9,492 specimens collected in Kansas, expressed in percentage of total number collected in each habitat--Continued

Species	Small grains	Legumes	Pasture	Corn	Weedy patches	Windrows	Roadside	Creek bottom	Environment not shown	Range	Grassland	Total specimens	Percentage of grand total
												Number	
Melanoplus mexicanus Sauss.	31.25	10.74	7.68	55.48	8.64	1.64	15.35	14.85	5.84	1.61	8.15	1,239	13.01
Melanoplus occidentalis Thos.	0.06	--	--	--	0.09	--	--	--	--	5.14	--	37	0.39
Melanoplus packardii Scudd.	2.73	2.06	2.07	2.44	0.09	--	6.14	3.63	1.78	0.44	2.14	184	1.93
Melanoplus lakinus Scudd.	1.92	0.64	0.07	1.22	0.19	--	3.95	1.32	1.30	--	0.97	84	0.88
Melanoplus regalis Dodge	0.06	--	0.14	--	0.19	--	--	0.99	0.49	0.29	0.19	17	0.18
Mermiria maculipennis Brun.	0.06	--	1.31	1.22	--	--	--	3.96	0.16	0.15	1.55	45	0.47
Mermiria neomexicana Thos.	--	--	0.55	--	--	--	--	--	--	--	0.53	11	0.12
Metator pardalinus Sauss.	--	--	--	--	--	--	--	--	--	0.29	--	2	0.02
Nymphs	51.96	65.49	75.43	4.27	72.87	--	49.99	29.04	36.50	1.03	--	4,803	50.43
Opeia obscura Thos.	--	--	0.07	--	--	--	--	--	3.73	--	37.85	242	2.54
Orphulella speciosa Scudd.	--	--	2.08	--	--	--	--	--	0.32	--	0.08	38	0.40
Orphulella pelidna Burm.	--	0.14	--	--	--	--	--	--	--	--	13.98	75	0.79
Paradalophora sp.	--	0.05	--	--	--	--	--	--	--	--	--	1	0.01
Phlibostroma quadrimaculatum Thos.	0.12	0.41	0.35	--	--	--	--	1.65	15.90	3.08	3.69	257	2.70
Phoetaliotes nebrascensis Thos.	--	--	0.14	1.22	--	--	--	--	--	--	0.58	7	0.07
Schistocerca lineata Scudd.	0.06	--	--	--	--	--	--	--	--	--	--	1	0.01
Spharagemon collare Scudd.	0.12	0.09	--	--	--	6.56	3.95	--	0.08	--	--	18	0.19
Spharagemon equale Say	0.25	0.32	0.07	--	--	--	0.88	--	--	0.29	--	16	0.17
Syrbula admirabilis Uhl.	--	--	0.42	--	--	--	--	--	0.08	--	6.21	39	0.41
Trimerotropis laticincta Sauss.	--	--	--	--	--	54.10	--	--	--	0.29	--	35	0.37
Trachyrhachis kiowa Thos.	0.12	0.09	0.35	--	--	11.48	1.32	--	3.89	4.40	0.97	102	1.07
Undetermined	0.06	0.09	--	--	--	--	--	--	--	--	--	3	0.03
Total specimens per environment	1,612	2,186	1,444	164	1,065	61	228	303	1,233	681	515	9,492	--

KANSAS

Small grains

		Percent
1.	Melanoplus mexicanus	31
2.	Melanoplus differentialis	4
3.	Melanoplus packardii	3
4.	Melanoplus lakinus	2
5.	Aulocara elliotti	2
6.	Twenty-one other species	58

Nymphs, 51.96
Undetermined adults, 0.06

Windrows

		Percent
1.	Trimerotropis laticincta	54
2.	Derotmema longipennis	20
3.	Trachyrhachis kiowa	11
4.	Spharagemon collare	7
5.	Aeoloplus turnbulli	3
6.	Two other species	5

Nymphs, none

Legumes

1.	Melanoplus mexicanus	11
2.	Melanoplus differentialis	9
3.	Melanoplus bivittatus	6
4.	Melanoplus packardii	2
5.	Ageneotettix deorum	1
6.	Twenty-five other species	71

Nymphs, 65.49
Undetermined adults, 0.09

Roadside

1.	Melanoplus mexicanus	15
2.	Aeoloplus turnbulli	9
3.	Melanoplus packardii	6
4.	Melanoplus lakinus	4
5.	Spharagemon collare	4
6.	Twelve other species	62

Nymphs, 49.99

Pasture

1.	Melanoplus mexicanus	8
2.	Ageneotettix deorum	4
3.	Orphulella speciosa	2
4.	Melanoplus packardii	2
5.	Aulocara elliotti	2
6.	Twenty-three other species	82

Nymphs, 75.43

Creek bottom

1.	Melanoplus bivittatus	26
2.	Melanoplus mexicanus	15
3.	Melanoplus differentialis	11
4.	Mermiria maculipennis	4
5.	Melanoplus packardii	4
6.	Twelve other species	40

Nymphs, 29.04

Corn

1.	Melanoplus mexicanus	55
2.	Melanoplus differentialis	14
3.	Melanoplus femur-rubrum	7
4.	Melanoplus bivittatus	7
5.	Ageneotettix deorum	3
6.	Nine other species	14

Nymphs, 4.27

Environment not shown

1.	Phlibostroma quadrimaculatum	16
2.	Ageneotettix deorum	11
3.	Melanoplus differentialis	8
4.	Melanoplus mexicanus	6
5.	Melanoplus bivittatus	6
6.	Nineteen other species	53

Nymphs, 36.50

Weedy patches

1.	Hesperotettix speciosus	13
2.	Melanoplus mexicanus	9
3.	Aeoloplus turnbulli	5
4.	Aulocara elliotti	0.19*
5.	Melanoplus lakinus	0.19*
6.	Five other species	72

Nymphs, 72.87

Range

1.	Cordillacris crenulata	60
2.	Aulocara elliotti	12
3.	Melanoplus occidentalis	5
4.	Trachyrhachis kiowa	4
5.	Drepanopterna femoratum	3
6.	Sixteen other species	16

Nymphs, 1.03

*These two species equal 1.

KANSAS--Continued

Grassland

		Percent
1.	Opeia obscura	38
2.	Ageneotettix deorum	14
3.	Orphulella pelidna	14
4.	Melanoplus mexicanus	8
5.	Syrbula admirabilis	6
6.	Seventeen other species	20
	Nymphs, none	

Percentage of grand total

1.	Melanoplus mexicanus	13
2.	Melanoplus differentialis	4
3.	Cordillacris crenulata	4
4.	Ageneotettix deorum	4
5.	Melanoplus bivittatus	3
6.	Forty-seven other species	72
	Nymphs, 50.43	

MICHIGAN

The most severe infestations were limited to the northern half of the Lower Peninsula. There were 2,582 specimens collected, most of which were Melanoplus mexicanus. Camnula pellucida was second in numbers and M. femur-rubrum third.

Distribution by species of 2,582 specimens collected in Michigan, expressed in percentage of total number collected in each habitat

Species	Small grains	Inland	Corn	Legumes	Pasture	Environment not shown	Total specimens	Percentage of grand total
							Number	
Ageneotettix deorum Scudd.	--	--	--	--	1.58	2.78	50	1.94
Arphia pseudonietana Thos.	--	4.17	--	--	1.01	1.44	30	1.16
Camnula pellucida Scudd.	--	29.17	--	9.43	17.25	7.67	354	13.70
Chorthippus longicornis Latr.	--	--	--	1.89	--	--	1	.04
Dissosteira carolina L.	--	--	--	--	--	.1	1	.04
Encoptolophus sordidus costalis Scudd.	--	4.17	--	--	--	.44	5	.19
Encoptolophus sordidus sordidus Burm.	--	--	--	--	.13	--	2	.08
Melanoplus angustipennis Dodge	--	--	--	--	--	1.00	9	.35
Melanoplus bivitattus Say	--	--	--	--	.13	.33	5	.19
Melanoplus dawsoni Scudd.	--	--	--	--	.13	--	2	.08
Melanoplus femur-rubrum Deg.	--	--	--	15.09	3.03	4.89	100	3.87
Melanoplus infantilis Scudd.	--	--	--	--	.19	--	3	.12
Melanoplus keeleri luxidus Dodge	--	--	--	--	.13	--	2	.08
Melanoplus mexicanus Saus.	100.0	54.17	100.0	73.58	76.09	80.10	1,999	77.36
Orphulella speciosa Scudd.	--	--	--	--	.13	--	2	.08
Schistocerca alutacea Harr.	--	--	--	--	--	.44	4	.15
Spharagemon collare Scudd.	--	--	--	--	.19	.89	11	.43
Nymphs	--	8.33	--	--	--	--	2	.08
Total specimens per environment	8	24	15	53	1,582	900	2,582	--

MICHIGAN

Small grains

	Percent
1. Melanoplus mexicanus -----	100

Nymphs, 0

Inland

1. Melanoplus mexicanus ----	54
2. Camnula pellucida -------	29
3. Arphia pseudonietana ----	4
4. Encoptolophus sordidus costalis ----------	4
5. One other species -------	9

Nymphs, 8.33

Corn

1. Melanoplus mexicanus ----	100

Nymphs, 0

Legumes

1. Melanoplus mexicanus ----	74
2. Melanoplus femur-rubrum --	15
3. Camnula pellucida -------	9
4. Chorthippus longicornis Latr. ----------	2

Nymphs, 0

Pasture

	Percent
1. Melanoplus mexicanus ------	76
2. Camnula pellucida ---------	17
3. Melanoplus femur-rubrum ---	3
4. Ageneotettix deorum -------	2
5. Arphia pseudonietana ------	1
6. Seven other species -------	1

Nymphs, 0

Environment not shown

1. Melanoplus mexicanus ------	80
2. Camnula pellucida ---------	8
3. Melanoplus femur-rubrum ---	5
4. Ageneotettix deorum -------	3
5. Arphia pseudonietana ------	1
6. Six other species ---------	3

Nymphs, 0

Percentage of grand total

1. Melanoplus mexicanus ----------	77
2. Camnula pellucida ----------	14
3. Melanoplus femur-rubrum ---------	4
4. Ageneotettix deorum ----------	2
5. Arphia pseudonietana ----------	1
6. Thirteen other species ---------	2

Nymphs, 0.08

MINNESOTA

Infestations increased in the southern half of the State during 1937. There were 10,583 specimens collected in the State, of which Camnula pellucida was the most numerous, Melanoplus mexicanus second, M. femur-rubrum third, and M. bivittatus fourth. M. mexicanus went from fourth place in 1935 to second place in 1937, making this exchange with M. bivittatus.

Distribution by species of 10,853 specimens collected in Minnesota, expressed in percentage of total number collected in each habitat

Species	Small grains	Legumes	Meadow	Pastures	Roadside	Idle land	Flax	Environment not given	Total specimens	Percentage of grand total
									Number	
Aeropedellus clavatus Thos.	--	--	--	.12	--	--	--	--	1	.01
Agenectettix deorum Scudd.	5.24	4.36	9.39	4.81	1.62	3.68	--	6.32	605	5.57
Arphia pseudonietana Thos.	.09	.05	.88	.25	.06	.15	--	.57	36	.33
Aulocara elliotti Thos.	--	.29	.35	--	.37	--	--	--	31	.29
Camnula pellucida Scudd.	20.70	16.41	14.79	55.12	29.53	37.41	3.70	32.76	2,342	21.55
Chlocaltis conspersa Harr.	--	--	--	.12	--	--	--	--	1	.01
Chorthippus longicornis Latr.	.86	.63	1.73	3.45	.50	4.29	--	--	151	1.39
Dissosteira carolina L.	3.30	1.79	.88	1.36	15.39	1.99	3.70	10.92	432	3.97
Encoptolophus sordidus costalis Scudd.	2.56	3.48	10.77	11.84	5.67	2.61	1.23	9.77	695	6.39
Eritettix simplex tricarinatus Thos.	--	--	.03	--	--	--	--	--	1	.01
Hesperotettix viridis Thos.	--	--	.06	--	--	--	--	--	2	.02
Melanoplus angustipennis Dodge	4.52	.92	2.17	.12	.75	3.07	--	--	221	2.03
Melanoplus bivittatus Say	13.56	10.55	5.28	10.36	15.38	13.13	19.13	9.77	1,161	10.68
Melanoplus bruneri Scudd.	--	.05	.03	--	.19	.31	--	--	7	.06
Melanoplus confusus Scudd.	--	.05	.03	--	--	--	--	--	2	.02
Melanoplus dawsoni Scudd.	5.88	4.03	7.91	8.63	6.04	9.50	1.23	.57	711	6.54
Melanoplus femur-rubrum Deg.	20.84	28.99	6.35	9.25	8.47	7.05	30.86	7.47	1,598	14.70
Melanoplus gladstoni Scudd.	.95	2.42	3.01	3.08	.31	1.23	--	--	205	1.89
Melanoplus infantilis Scudd.	.09	.73	2.73	.62	.12	--	--	.57	112	1.03
Melanoplus keeleri luridus Dodge	.09	.39	.03	--	.12	.15	--	--	14	.13
Melanoplus mexicanus Sauss.	15.60	16.84	22.67	7.64	8.53	10.27	37.03	11.49	1,761	16.20
Melanoplus packardii Scudd.	2.71	2.47	1.10	.37	2.37	1.38	1.85	3.45	213	1.96
Metator pardalinus Sauss.	.09	.10	.22	--	--	--	--	.57	12	.11
Opeia obscura Thos.	--	.15	--	--	--	--	--	--	3	.03
Orphulella pelidna Burm.	.63	.39	.50	--	.12	.15	--	--	40	.37
Orphulella speciosa Scudd.	.27	.10	.91	.12	.37	.15	--	1.15	47	.43
Phoetaliotes nebrascensis Thos.	.27	.68	1.79	.12	.19	--	--	1.15	83	.76
Spharagemon collare Scudd.	1.49	1.50	2.64	.37	1.68	3.53	1.23	2.87	208	1.91
Stethophyma lineatum Scudd.	--	--	--	--	.06	--	--	--	1	.01
Trachyrhachis kiowa Thos.	.23	.53	2.83	1.23	.12	.15	--	.57	121	1.11
Nymphs	--	1.06	.25	--	.37	--	--	--	36	.33
Total specimens per environment	2,210	2,062	3,179	811	1,603	652	162	174	10,853	--

MINNESOTA

Small grains

		Percent
1.	Melanoplus femur-rubrum	21
2.	Camnula pellucida	21
3.	Melanoplus mexicanus	16
4.	Melanoplus bivittatus	14
5.	Melanoplus dawsoni	6
6.	Sixteen other species	22

Nymphs, 0

Legumes

1.	Melanoplus femur-rubrum	29
2.	Melanoplus mexicanus	17
3.	Camnula pellucida	16
4.	Melanoplus bivittatus	11
5.	Melanoplus dawsoni	6
6.	Twenty other species	21

Nymphs, 1.06

Meadow

1.	Melanoplus mexicanus	23
2.	Camnula pellucida	15
3.	Encoptolophus sordidus costalis	11
4.	Ageneotettix deorum	9
5.	Melanoplus dawsoni	8
6.	Twenty-one other species	34

Nymphs, 0.25

Pastures

1.	Camnula pellucida	36
2.	Encoptolophus sordidus costalis	12
3.	Melanoplus bivittatus	10
4.	Melanoplus femur-rubrum	9
5.	Melanoplus dawsoni	9
6.	Nineteen other species	24

Nymphs, 0

Roadside

		Percent
1.	Camnula pellucida	30
2.	Melanoplus bivittatus	16
3.	Dissosteira carolina	15
4.	Melanoplus mexicanus	9
5.	Melanoplus femur-rubrum	8
6.	Eighteen other species	21

Nymphs, 0.37

Idle land

1.	Camnula pellucida	37
2.	Melanoplus bivittatus	13
3.	Melanoplus mexicanus	10
4.	Melanoplus dawsoni	9
5.	Melanoplus femur-rubrum	7
6.	Eighteen other species	24

Nymphs, 0

Flax

1.	Melanoplus mexicanus	37
2.	Melanoplus femur-rubrum	31
3.	Melanoplus bivittatus	19
4.	Camnula pellucida	4
5.	Dissosteira carolina	4
6.	Four other species	34

Nymphs, 0

Environment not shown

1.	Camnula pellucida	33
2.	Melanoplus mexicanus	11
3.	Dissosteira carolina	11
4.	Encoptolophus sordidus costalis	10
5.	Melanoplus bivittatus	10
6.	Eleven other species	25

Nymphs, 0

Percentage of grand total

1.	Camnula pellucida	22
2.	Melanoplus mexicanus	16
3.	Melanoplus femur-rubrum	15
4.	Melanoplus bivittatus	11
5.	Melanoplus dawsoni	7
6.	Twenty-five other species	31

Nymphs, 0.33

MONTANA

The infestations were scattered throughout the eastern two-thirds of the State. Of the 14,481 specimens taken in the State in 1937, Melanoplus mexicanus was by far the most numerous, Aulocara elliotti was second, and Agenectettix deorum third. There was no change between 1936 and 1937 in the five most numerous species found in the collections, except for position.

Distribution by species, of 14,481 specimens collected in Montana, expressed in percentage of total number collected in each habitat

Species	Range	Small grains	Reversion	Roadside	Alfalfa	Meadow	Corn	Weeds	Beets	Environment not shown	Mixed environment	Total specimens (Number)	Percentage of grand total
Acrolophitus hirtipes Say	0.02	—	0.10	—	—	—	—	—	—	—	—	2	0.02
Aerochoreutes carlinianus Thos.	.04	—	—	0.07	—	—	—	—	—	—	—	3	.02
Aeoloplus turnbulli Thos.	.73	0.27	2.40	1.08	0.30	—	—	0.46	24.14	—	4.24	141	.97
Aeropedellus clavatus Thos	.91	.14	—	.29	—	.30	—	—	—	—	—	57	.39
Ageneotettix deorum Scudd.	13.57	2.33	2.66	5.49	1.70	2.41	—	.46	—	1.30	.50	944	6.51
Amphitornus coloradus Thos.	1.51	.07	.21	2.82	.09	—	—	—	—	—	—	124	.86
Arphia pseudonietana Thos.	.04	—	—	—	—	—	—	—	—	—	—	2	.01
Aulocara elliotti Thos.	15.77	6.29	2.35	9.24	2.50	8.60	—	1.37	—	4.19	2.24	1,292	8.91
Boopedon nubilum Say	.15	—	—	—	—	—	—	—	—	—	—	8	.06
Brachystola magna Gir.	—	—	.05	—	—	—	0.60	—	—	—	—	2	.01
Bruneria brunnea Thos.	.14	.17	—	.29	.18	—	—	—	—	—	—	18	.12
Camnula pellucida Scudd.	1.24	2.43	.16	3.59	4.65	29.86	1.80	.91	—	2.99	8.23	560	3.86
Chloealtis conspersa Harr.	—	—	—	.07	—	—	—	—	—	—	—	1	.01
Chorthippus longicornis Latr.	—	—	—	—	.27	.30	—	—	—	—	—	5	.03
Cordillacris crenulata Brun.	1.75	—	—	.14	—	—	—	—	—	—	—	93	.64
Cordillacris occipitalis Thos.	.60	.03	—	—	—	.15	—	—	—	—	—	33	.23
Cratypedes neglectus Thos.	.04	.03	—	—	—	—	—	—	—	.20	.25	5	.03
Derotmema haydenii Thos.	.42	.44	.42	1.44	.18	—	.60	—	—	—	.25	67	.46
Dissosteira carolina L.	.75	1.61	2.24	.43	—	—	1.80	.46	—	—	.75	142	.98
Drepanopterna femoratum Scudd.	1.83	.07	.42	1.59	.27	.30	—	—	—	—	—	132	.91
Encoptolophus sordidus costalis Scudd.	.27	.07	—	.22	—	.15	—	—	—	—	2.74	31	.21
Hadrotettix trifasciatus Say	.52	.24	.84	.22	.09	—	—	.46	—	—	.50	57	.39
Hesperotettix viridis Thos.	.25	.31	.05	.94	—	.15	—	—	—	—	—	37	.26
Hypochlora alba Dodge	—	—	—	.43	—	—	—	—	—	—	—	6	.04
Melanoplus angustipennis Dodge	.08	1.57	3.65	.07	.72	—	1.80	—	—	—	2.24	141	.97

Distribution by species, of 14,481 specimens collected in Montana, expressed in percentage of total number collected in each habitat-- Continued

Species	Range	Small grains	Reversion	Roadside	Alfalfa	Meadow	Corn	Weeds	Beets	Environment not shown	Mixed environment	Total specimens	Percentage of grand total
												Number	
Melanoplus bivittatus Say	0.29	3.39	0.42	3.54	2.32	7.24	8.38	--	3.45	5.99	4.24	307	2.12
Melanoplus bowditchi Scudd.	.23	.03	.26	.58	--	--	--	--	--	--	--	26	.18
Melanoplus confusus Scudd.	.85	.24	.05	.36	--	1.21	1.80	--	--	.20	--	69	.48
Melanoplus dawsoni Scudd.	.02	.03	--	.29	.63	--	--	--	--	--	--	13	.09
Melanoplus differentialis Thos.	.10	--	--	--	.18	1.66	--	--	31.03	--	--	27	.19
Melanoplus femur-rubrum Deg.	.85	2.77	.73	1.59	15.65	12.37	--	1.37	--	7.39	27.92	570	3.93
Melanoplus foedus fluviatilis Brun.	--	--	--	--	.09	--	--	--	--	.20	--	2	.01
Melanoplus gladstoni Scudd.	.19	.14	.57	--	.18	--	--	--	--	--	--	27	.19
Melanoplus infantilis Scudd.	2.24	.89	.63	1.01	--	--	.60	--	--	2.99	.25	185	1.28
Melanoplus kennicotti Scudd.	.14	--	--	--	--	--	--	--	--	--	--	7	.05
Melanoplus mexicanus Sauss.	9.77	46.96	69.01	18.70	23.33	25.79	61.68	73.06	41.38	15.97	27.42	4,357	30.06
Melanoplus occidentalis Thos.	1.37	.14	.42	.07	.18	.30	--	--	--	.40	1.00	94	.65
Melanoplus packardii Scudd.	1.12	4.34	4.49	3.68	4.11	2.26	11.98	4.11	--	3.19	9.97	468	3.23
Mermiria maculipennis Brun.	.25	--	--	--	--	--	--	--	--	--	--	13	.09
Metator pardalinus Sauss.	4.67	.58	.47	5.27	.18	.30	.60	--	--	--	--	346	2.39
Opeia obscura Thos.	1.39	.03	.05	--	--	--	--	--	--	--	--	74	.51
Orphulella pelidna Burm.	.06	--	--	--	--	--	--	--	--	--	--	3	.02
Phlibostroma quadrimaculatum Thos.	3.88	.03	.21	.29	--	--	--	--	--	--	--	210	1.45
Phoetaliotes nebrascensis Thos.	.12	.27	--	.22	--	--	--	--	--	--	.50	19	.13
Spharagemon collare Scudd.	.14	.48	3.08	.43	1.25	.45	1.80	--	--	--	.25	107	.74
Spharagemon equale Say.	.17	.75	.37	.07	--	--	--	--	--	--	--	39	.27
Trimerotropis campestris McN.	--	--	--	--	--	--	--	--	--	.40	--	2	.01
Trimerotropis pallidipennis Burm.	.06	--	--	--	--	--	--	--	--	--	--	3	.02
Trachyrhachis kiowa Thos.	2.07	.10	.16	.29	--	--	--	--	--	.20	--	118	.81
Nymphs	29.14	22.57	3.39	30.11	40.41	6.18	6.59	17.35	--	54.09	6.48	3,491	24.09
Total specimens per environment	5,167	2,919	1,913	1,384	1,118	663	167	219	29	501	401	14,481	--

MONTANA

Range

		Percent
1.	Aulocara elliotti	16
2.	Ageneotettix deorum	14
3.	Melanoplus mexicanus	10
4.	Metator pardalinus	5
5.	Phlibostroma quadrimaculatum	4
6.	Thirty-eight other species	51

Nymphs, 29.14

Meadow

		Percent
1.	Camnula pellucida	30
2.	Melanoplus mexicanus	26
3.	Melanoplus femur-rubrum	12
4.	Aulocara elliotti	9
5.	Melanoplus bivittatus	7
6.	Thirteen other species	16

Nymphs, 6.18

Small grains

1.	Melanoplus mexicanus	47
2.	Aulocara elliotti	6
3.	Melanoplus packardii	4
4.	Melanoplus bivittatus	3
5.	Melanoplus femur-rubrum	3
6.	Twenty-eight other species	37

Nymphs, 22.57

Corn

1.	Melanoplus mexicanus	62
2.	Melanoplus packardii	12
3.	Melanoplus bivittatus	8
4.	Camnula pellucida	2
5.	Dissosteira carolina	2
6.	Seven other species	14

Nymphs, 6.59

Reversion

1.	Melanoplus mexicanus	69
2.	Melanoplus packardii	4
3.	Melanoplus angustipennis	4
4.	Spharagemon collare	3
5.	Ageneotettix deorum	3
6.	Twenty-three other species	17

Nymphs, 3.39

Weeds

1.	Melanoplus mexicanus	73
2.	Melanoplus packardii	4
3.	Aulocara elliotti	2
4.	Melanoplus femur-rubrum	1
5.	Camnula pellucida	1
6.	Four other species	20

Nymphs, 17.35

Roadside

1.	Melanoplus mexicanus	19
2.	Aulocara elliotti	9
3.	Camnula pellucida	9
4.	Ageneotettix deorum	5
5.	Metator pardalinus	5
6.	Twenty-eight other species	53

Nymphs, 30.11

Beets

1.	Melanoplus mexicanus	41
2.	Melanoplus differentialis	31
3.	Aeoloplus turnbulli	24
4.	Melanoplus bivittatus	4

Nymphs, 0

Alfalfa

1.	Melanoplus mexicanus	23
2.	Melanoplus femur-rubrum	16
3.	Camnula pellucida	5
4.	Melanoplus packardii	4
5.	Aulocara elliotti	3
6.	Seventeen other species	39

Nymphs, 40.41

Environment not shown

1.	Melanoplus mexicanus	16
2.	Melanoplus femur-rubrum	7
3.	Melanoplus bivittatus	6
4.	Aulocara elliotti	4
5.	Melanoplus packardii	3
6.	Nine other species	64

Nymphs, 54.09

MONTANA--Continued

Mixed environment

		Percent
1.	Melanoplus femur-rubrum	28
2.	Melanoplus mexicanus	27
3.	Melanoplus packardii	10
4.	Camnula pellucida	8
5.	Aulocara elliotti	2
6.	Thirteen other species	25
	Nymphs, 6.48	

Percentage of grand total

1.	Melanoplus mexicanus	30
2.	Aulocara elliotti	9
3.	Ageneotettix deorum	7
4.	Melanoplus femur-rubrum	4
5.	Camnula pellucida	4
6.	Forty-four other species	46
	Nymphs, 24.09	

NEBRASKA

Except for the large sand-hill area in the middle of the State, there were severe infestations throughout the eastern and southern parts and threatening outbreaks in the western part. Of the 11,088 specimens collected in the State, M. mexicanus was the most numerous, Cordillacris occipitalis was second, and M. angustipennis, M. differentialis, and M. bivittatus next in numbers. No collections were made in 1936, but in 1935 M. femur-rubrum was most numerous among the specimens collected in the eastern part of the State. Cordillacris occipitalis did not appear in the collections that year. A second generation of M. mexicanus occurred in the State in 1937 and numbered from 15 to 100 per square yard. This generation damaged winter wheat so severely that a second control campaign was necessary in the fall. A large percentage of the 11,088 specimens were nymphs, probably of M. mexicanus.

Distribution by species of 11,088 specimens collected in Nebraska, expressed in percentage of total number collected in each habitat

Species	Creek bottom	Prairie	Environment not shown	Legumes	Corn	Idle land	Range	Small grains	Roadside	Total specimens	Percentage of grand total
										Number	
Aeoloplus turnbulli Thos.	0.75	1.48	2.27	2.16	--	2.52	3.01	3.58	--	235	2.12
Ageneotettix deorum Scudd.	6.33	8.30	5.35	1.47	--	6.36	6.61	2.26	1.45	471	4.24
Aeropedellus clavatus Thos.	--	--	--	--	--	--	--	--	--	--	--
Acrolophitus hirtipes Say	--	0.15	0.05	--	--	0.11	--	--	--	3	0.03
Aulocara elliotti Thos.	11.14	4.89	2.63	0.09	--	10.85	8.11	1.13	0.22	426	3.83
Amphitornus coloradus Thos.	1.66	1.19	1.13	--	--	.33	3.11	--	--	105	.95
Brachystola magna Gir.	--	--	.05	.06	--	--	--	--	--	3	.03
Boopedon nubilum Say	--	.44	--	.03	--	--	--	--	--	4	.04
Chorthippus longicornis Latr.	--	--	.09	--	--	--	--	--	--	2	.02
Cordillacris crenulata Brun.	--	.15	2.22	--	--	.22	1.99	--	--	89	.80
Conocephalus concinnum delicatum Brun.	1.20	--	--	--	--	--	--	--	--	8	.07
Cord. occipitalis Thos.	15.36	9.64	1.27	--	--	19.84	13.37	0.19	--	626	5.63
Derotmema haydenii Thos.	.30	--	.59	.90	--	--	--	.38	.11	48	.43
Dichromorpha viridis Scudd.	--	--	.05	--	--	--	--	--	--	1	.01
Dissosteira carolina L.	.30	.30	.14	--	1.00	--	--	.38	.22	13	.12
Dissosteira longipennis Thos.	--	--	.05	--	--	.11	--	--	--	2	.02
Drepanopterna fenoratum Scudd.	--	1.78	1.63	--	--	--	5.53	--	--	151	1.36
Dactylotum pictum Thos.	--	.15	.09	--	--	--	--	--	--	3	.03
Encoptolophus sordidus costalis Scudd.	--	--	--	.39	--	--	--	--	.11	14	.13
Hadrotettix trifasciatus Say	--	--	.36	.06	--	--	.27	--	.22	17	.15
Hypochlora alba Dodge	--	--	.14	--	--	--	--	--	--	3	.03
Hesperotettix viridis Thos.	.45	1.19	.82	.03	--	.11	.16	--	.67	40	.36
Hippiscus rugosus Scudd.	--	--	--	--	--	--	.05	--	--	1	.01
Melanoplus angustipennis Dodge	2.41	3.71	4.26	4.77	--	2.74	11.92	5.66	2.12	590	5.31
Melanoplus bivittatus Say	3.01	.89	7.52	4.92	1.00	.22	.43	1.32	9.71	462	4.16
Melanoplus confusus Scudd.	.60	.89	.23	.12	--	.11	.97	.19	.22	41	.37
Melanoplus differentialis Thos.	1.81	6.38	6.02	7.29	6.50	2.19	--	1.13	7.25	535	4.82
Melanoplus flavidus flavidus Scudd.	.30	.59	1.00	.12	--	--	1.99	3.96	.11	91	.82
Melanoplus femur-rubrum Deg.	3.01	.59	5.30	5.16	--	.77	.05	.75	1.00	334	3.01
Melanoplus foedus foedus Scudd.	4.37	2.67	1.99	2.61	--	1.42	2.04	9.05	--	277	2.49
Melanoplus foedus fluviatilis Brun.	.15	--	.09	.09	--	.44	--	--	--	10	.09

Distribution by species of 11,088 specimens collected in Nebraska, expressed in percentage of total number collected in each habitat--Continued

Species	Creek bottom	Prairie	Environment not shown	Legumes	Corn	Idle land	Range	Small grains	Roadside	Total specimens	Percentage of grand total
										Number	
Melanoplus gladstoni Scudd.	--	--	0.09	--	--	--	--	0.19	--	5	0.05
Melanoplus keeleri luridus Dodge	--	--	.05	--	--	--	--	--	--	1	.01
Melanoplus mexicanus Sauss.	4.52	13.79	17.62	15.21	1.50	8.77	1.88	32.63	4.46	1,350	12.15
Melanoplus lakinus Scudd.	--	--	.14	.24	--	--	--	--	--	11	.10
Melanoplus occidentalis Thos.	--	.74	.95	.03	--	1.86	2.79	--	.11	97	.87
Melanoplus packardii Scudd.	.15	2.52	1.68	1.65	--	.88	.81	1.32	1.00	149	1.34
Melanoplus regalis Dodge	--	--	.27	--	--	--	--	--	--	6	.05
Melanoplus sp.	--	2.22	--	--	--	--	--	--	--	15	.14
Mermiria maculipennis Brun.	.60	1.78	.54	.03	--	5.92	.70	--	.22	98	.88
Mermiria maculipennis macclungi Rehn	--	--	--	--	--	--	--	--	.22	2	.02
Metator paralinus Sauss.	13.10	.30	.05	--	--	1.97	.38	.19	--	116	1.04
Orphulella speciosa Scudd.	--	--	--	--	--	.11	--	.19	--	2	.02
Orphulella pelidna Burm.	--	--	.14	--	--	--	--	--	--	3	.03
Opeia obscura Thos.	--	3.71	.05	--	--	--	.11	--	--	28	.25
Paropomala wyomingensis Thos.	--	--	.14	--	--	.11	.54	--	--	14	.13
Phlib. quadrimaculatum Thos.	.30	4.45	6.12	--	--	.33	7.46	--	--	309	2.78
Phoetaliotes nebrascensis Thos.	--	.44	.32	.06	--	--	.21	--	.11	17	.15
Schistocerca lineata Scudd.	--	--	--	--	--	--	.05	--	--	1	.01
Spharagemon collare Scudd.	1.81	.74	1.04	.87	--	1.32	1.29	2.26	1.00	126	1.13
Spharagemon equale Say	.15	--	.41	.03	--	1.10	.48	.57	--	33	.30
Trachyrhachis kiowa Thos.	4.97	4.15	3.35	.06	--	3.84	3.76	--	.11	243	2.19
Trimerotropis agrestis McN.	--	--	--	--	--	--	.11	--	--	2	.02
Trimerotropis pallidipennis Burm.	--	--	.09	--	--	--	--	--	--	2	.02
Xanthippus corallipes Hald.	--	--	--	--	--	--	.05	--	--	1	.01
Nymphs	21.23	19.72	21.61	51.12	--	25.43	19.76	32.63	69.30	3,849	34.64
Undetermined	--	--	--	.09	--	--	--	--	--	3	.03
Total specimens per environment	664	674	2,206	3,324	20	912	1,862	530	896	11,088	---

NEBRASKA

Creek bottom

		Percent
1.	Cordillacris occipitalis	15
2.	Metator pardalinus	13
3.	Aulocara elliotti	11
4.	Ageneotettix deorum	6
5.	Trachyrhachis kiowa	5
6.	Twenty-one other species	50

Nymphs, 21.23
Undetermined, 0

Idle land

		Percent
1.	Cordillacris occipitalis	20
2.	Aulocara elliotti	11
3.	Melanoplus mexicanus	9
4.	Ageneotettix deorum	6
5.	Mermiria maculipennis	6
6.	Twenty-three other species	48

Nymphs, 25.43
Undetermined, 0

Prairie

1.	Melanoplus mexicanus	14
2.	Cord. occipitalis	10
3.	Ageneotettix deorum	8
4.	Melanoplus differentialis	6
5.	Aulocara elliotti	5
6.	Thirty-one other species	57

Nymphs, 19.72
Undetermined, 0

Range

1.	Cord. occipitalis	13
2.	Melanoplus angustipennis	12
3.	Aulocara elliotti	8
4.	Phlibostroma quadrimaculatum	7
5.	Ageneotettix deorum	7
6.	Twenty-seven other species	53

Nymphs, 19.76
Undetermined, 0

Environment not shown

1.	Melanoplus mexicanus	18
2.	Melanoplus bivittatus	8
3.	Phlibostroma quadrimaculatum	6
4.	Melanoplus differentialis	6
5.	Ageneotettix deorum	5
6.	Forty-one other species	57

Nymphs, 21.61
Undetermined, 0

Small grains

1.	Melanoplus mexicanus	37
2.	Melanoplus angustipennis	7
3.	Melanoplus foedus foedus	9
4.	Melanoplus flavidus flavidus	4
5.	Aeoloplus turnbulli	4
6.	Sixteen other species	39

Nymphs, 32.63
Undetermined, 0

Legumes

1.	Melanoplus mexicanus	15
2.	Melanoplus differentialis	7
3.	Melanoplus femur-rubrum	5
4.	Melanoplus bivittatus	5
5.	Melanoplus angustipennis	5
6.	Twenty-two other species	63

Nymphs, 0
Undetermined, 0

Roadside

1.	Melanoplus bivittatus	10
2.	Melanoplus differentialis	7
3.	Melanoplus mexicanus	4
4.	Melanoplus angustipennis	6
5.	Melanoplus flavidus flavidus	4
6.	Seventeen other species	69

Nymphs, 69.30
Undetermined, 0

Percentage of grand total

1.	Melanoplus mexicanus	12
2.	Cord. occipitalis	6
3.	Melanoplus angustipennis	5
4.	Melanoplus differentialis	5
5.	Melanoplus bivittatus	4
6.	Fifty-three other species	68

Nymphs, 34.64
Undetermined, 0

NEW MEXICO

The northeastern portion of the State was the most heavily infested, with Dissosteira longipennis as the most important species. This is not shown in the 713 specimens collected, among which Melanoplus femur-rubrum ranks first in numbers and D. longipennis second.

Distribution by species of 713 specimens collected in New Mexico, expressed in percentage of total number collected in each habitat

Species	Environment not shown	Range	Roadside	Native sod	Total specimens	Percentage of grand total
					Number	
Ageneotettix deorum Scudd.	--	11.51	--	--	35	4.91
Arphia pseudonietana Thos.	--	--	--	20.00	1	0.14
Aulocara elliotti Thos.	--	2.30	--	--	7	.98
Brachystola magna Gir.	--	1.32	--	--	4	.56
Camnula pellucida Scudd.	0.75	--	--	--	3	.42
Campylacantha olivacea Scudd.	--	10.52	--	--	32	4.49
Cordillacris crenulata Brun.	--	.33	--	--	1	.14
Dactylotum pictum Thos.	--	.33	--	--	1	.14
Derotmema haydeni Thos.	--	2.96	--	--	9	1.26
Dissosteira carolina L.	--	.66	--	--	2	.28
Dissosteira longipennis Thos.	31.15	3.62	--	20.00	136	19.07
Drepanopterna femoratum Scudd.	.25	--	--	--	1	.14
Encoptolophus sordidus Brun.	1.76	27.96	--	--	92	12.90
Hadrotettix trifasciatus Say	.75	.99	--	--	6	.84
Hesperotettix viridis Thos.	--	1.32	--	--	4	.56
Melanoplus bivittatus Say	2.26	1.64	--	--	14	1.96
Melanoplus femur-rubrum Deg.	48.73	1.32	--	--	198	27.76
Melanoplus foedus foedus Scudd.	3.27	4.28	--	--	26	3.65
Melanoplus flavidus flavidus Scudd.	--	.99	--	--	3	.42
Melanoplus differentialis Thos.	3.01	--	--	--	12	1.68
Melanoplus gladstoni Scudd.	4.02	1.32	--	--	20	2.80
Melanoplus lakinus Scudd.	2.01	--	--	20.00	9	1.26
Melanoplus mexicanus Sauss.	.25	2.63	--	--	9	1.26
Melanoplus occidentalis Thos.	--	4.93	--	--	15	2.10
Melanoplus packardii Scudd.	.25	--	--	20.00	2	.28
Mermiria neomexicana Thos.	--	.33	--	--	1	.14
Mermiria sp.	--	.66	--	--	2	.28
Paropomola wyomingensis Thos.	--	.33	--	--	1	.14
Philib. quadrimaculatum Thos.	--	.99	--	--	3	.42
Spharagemon collare Scudd.	.25	3.62	--	--	12	1.68
Schistocerca sp.	--	.66	--	--	2	.28
Schistocerca lineata Scudd.	--	1.32	16.67	--	5	.70
Schistocerca shoshone Thos.	--	--	33.33	--	2	.28
Trachyrhachis kiowa Thos.	.50	3.29	--	--	12	1.68
Trimerotropis laticincta Sauss.	.25	--	--	--	1	.14
Trimerotropis pallidipennis Burm.	.50	--	--	20.00	3	.42
Undetermined	--	7.89	50.00	--	27	3.79
Total specimens per environment	398	304	6	5	713	--

NEW MEXICO

Environment not shown

		Percent
1.	Melanoplus femur-rubrum	49
2.	Dissosteira longipennis	31
3.	Melanoplus gladstoni	4
4.	Melanoplus foedus foedus	3
5.	Melanoplus differentialis	3
6.	Twelve other species	10

Undetermined adults, 0

Roadside

		Percent
1.	Schistocerca shoshone	33
2.	Schistocerca lineata	17
3.	One other species	50

Undetermined adults, 50

Range

1.	Encoptolophus sordidus	28
2.	Agenceotettix deorum	12
3.	Campylacantha olivacea	11
4.	Melanoplus occidentalis	5
5.	Melanoplus foedus foedus	4
6.	Twenty-three other species	40

Undetermined adults, 8

Native sod

1.	Arphia pseudonietana	20
2.	Dissosteira longipennis	20
3.	Melanoplus lakinus	20
4.	Melanoplus packardii	20
5.	Trimerotropis pallidipennis	20

Percentage of grand total

1.	Melanoplus femur-rubrum	28
2.	Dissosteira longipennis	19
3.	Encoptolophus sordidus	13
4.	Agenceotettix deorum	5
5.	Camphylacantha olivacea	4
6.	Thirty-two other species	31

Undetermined adults, 4

NORTH DAKOTA

Of the 24,961 specimens collected in North Dakota, about 60 percent were Melanoplus mexicanus. Agenceotettix deorum Scudd. was next in numbers and Metator pardalinus Sauss., Camnula pellucida, and Melanoplus femur-rubrum next in order of abundance. The outbreaks in 1938 were composed mainly of M. mexicanus, which hatched in enormous numbers in grain stubble, idle land, and rangeland adjacent to crops.

Distribution by species of 24,961 specimens collected in North Dakota, expressed in percentage of total number collected in each habitat

Species	Small grain	Idle land	Range	Weeds	Meadow	Roadside	Reversion	Corn	Legumes	Pasture	River bottom	Total specimens	Percentage of grand total
												Number	
Aeoloplus turnbulli bruneri Caud.	0.12	1.66	0.17	--	0.37	0.07	--	0.90	--	--	--	104	0.42
Aerochoreutes carlinianus Thos.	--	--	.12	--	--	--	--	--	--	--	--	1	.01
Aeropedellus clavatus Thos.	.04	--	.37	--	.92	--	--	--	--	--	--	34	.14
Acrolophitus hirtipes Say	--	--	.02	--	--	--	--	--	--	--	--	1	.01
Agenectettix deorum Scudd.	1.81	2.02	25.49	1.31	9.59	3.78	3.97	2.03	3.19	5.87	16.67	1,891	7.56
Amphitornus coloradus Thos.	.01	--	3.22	--	1.66	.07	1.59	--	--	.70	--	200	.80
Arphia pseudonietana Thos.	--	--	.04	--	.09	--	--	--	--	.23	--	5	.02
Aulocara elliotti Thos.	.47	.45	10.19	.22	3.32	.95	.79	.23	--	.23	8.97	676	2.70
Bruneria brunnea Thos.	--	--	.37	--	.09	--	--	--	--	.12	--	22	.09
Camnula pellucida Scudd.	4.57	.23	3.55	.44	9.96	2.18	14.28	1.13	--	5.87	1.28	898	3.59
Chorthippus longicornis Latr.	--	.02	.13	--	.46	.22	--	--	3.19	.23	--	26	.10
Cordillacris crenulata Brun.	--	--	.06	--	--	--	--	--	--	--	--	3	.01
Cordillacris occipitalis Thos.	--	--	.13	--	--	--	--	--	--	--	--	7	.03
Dactylotum pictum Thos.	--	--	.02	--	--	--	--	--	--	--	1.28	2	.01
Derotmema haydenii Thos.	.04	.09	.17	--	.28	.07	--	--	--	--	--	21	.08
Dissosteira carolina L.	1.04	.27	.04	.88	.55	.87	--	1.81	.40	--	--	155	.62
Drepanopterna femoratum Scudd.	.01	.02	1.46	--	--	.29	--	--	--	--	5.13	88	.35
Encoptolophus sordidus costalis Scudd.	.28	.05	.11	.44	2.49	.07	--	.68	--	4.46	1.28	110	.44
Hadrotettix trifasciatus Say	.07	.16	.28	--	.09	.29	--	--	--	.12	--	35	.14
Hesperotettix viridis Thos.	.09	.23	.49	--	.92	.58	.79	--	--	.23	--	66	.26
Hypochlora alba Dodge	.01	--	.07	--	--	--	--	--	--	--	--	5	.02
Melanoplus angustipennis Dodge	.32	1.18	.19	.22	1.48	.15	--	.68	--	--	2.56	120	.48
Melanoplus bivittatus Say	1.30	2.02	.19	2.63	.28	3.93	--	2.93	6.77	.23	--	338	1.35
Melanoplus bowditchi Scudd.	.01	--	.02	--	--	--	--	--	--	--	--	2	.01
Melanoplus bruneri Scudd.	.01	--	--	--	--	.07	--	--	--	--	--	2	.01
Melanoplus confusus Scudd.	.01	--	.32	--	--	.07	--	--	.80	--	--	21	.08
Melanoplus dawsoni Scudd.	.26	.07	1.23	--	1.29	.87	--	--	.40	2.46	--	143	.57
Melanoplus differentialis Thos.	.02	--	--	--	--	.51	--	--	--	--	--	9	.04
Melanoplus femur-rubrum Deg.	4.21	5.08	.79	7.00	.74	3.49	3.17	4.74	7.97	1.41	--	856	3.42
Melanoplus flavidus flavidus Scudd.	.08	.02	.02	--	--	--	--	--	--	--	--	10	.04
Melanoplus gladstoni Scudd.	.54	.68	.22	.44	.65	.44	2.38	--	--	2.46	1.28	139	.56

Distribution by species of 24,961 specimens collected in North Dakota, expressed in percentage of total number collected in each habitat--Continued

Species	Small grains	Idle land	Range	Weeds	Meadow	Roadside	Reversion	Corn	Legumes	Pasture	Riverbottom	Total specimens	Percentage of grand total
												Number	
Melanoplus infantilis Scudd.	0.22	0.14	4.19	0.66	5.35	0.51	1.59	--	0.40	7.62	3.85	392	1.57
Melanoplus mexicanus Sauss.	76.94	75.00	13.97	75.92	41.12	65.14	46.82	76.06	71.71	46.33	32.05	14,878	59.51
Melanoplus occidentalis Thos.	--	.02	.37	.22	.09	--	--	--	--	--	--	23	.09
Melanoplus packardii Scudd.	4.44	5.72	1.87	7.44	1.11	6.98	3.17	5.87	5.18	.47	1.28	1,012	4.05
Mermiria maculipennis Brun.	.01	--	.49	--	--	--	--	--	--	--	--	27	.11
Metator pardalinus Sauss.	.54	.16	12.68	.88	4.24	5.23	2.38	.23	--	5.04	8.97	918	3.67
Neopodismopsis abdominalis Thos.	--	--	--	--	.18	--	--	--	--	--	--	2	.01
Opeia obscura Thos.	.03	.02	.45	--	.09	--	--	--	--	.70	1.28	36	.14
Orphulella pelidna Burm.	--	--	--	--	.09	--	--	--	--	--	--	1	.01
Orphulella speciosa Scudd.	--	--	.07	--	--	--	--	--	--	.70	--	10	.04
Phlibostroma quadrimaculatum Thos.	.03	--	5.29	--	.37	--	--	--	--	4.81	3.85	334	1.34
Rhoetaliotes nebrascensis Thos.	.42	.02	.47	.22	.28	.15	--	1.13	--	2.46	--	102	.41
Spharagemon collare Scudd.	1.20	2.22	.07	1.09	1.11	.65	--	1.58	--	.82	3.85	272	1.09
Spharagemon equale Say	.12	--	.26	--	.09	.07	--	--	--	--	--	29	.12
Trachyrhachis kiowa Thos.	.02	--	4.39	--	3.23	.29	17.46	--	--	2.46	6.41	325	1.30
Trimerotropis pistrinaria Sauss.	--	--	--	--	--	--	1.59	--	--	--	--	2	.01
Trimerotropis laticincta Sauss.	--	--	.04	--	--	--	--	--	--	--	--	2	.01
Xanthippus corallipes latefasciatus Scudd.	--	.02	--	--	--	--	--	--	--	--	--	1	.01
Nymphs	.64	2.22	5.61	--	7.38	1.89	--	--	--	3.87	--	605	2.42
Total specimens per environment	10,573	4,397	5,326	457	1,084	1,374	126	443	251	852	78	24,961	---

NORTH DAKOTA

Small grains

		Percent
1.	Melanoplus mexicanus	77
2.	Camnula pellucida	5
3.	Melanoplus packardii	4
4.	Melanoplus femur-rubrum	4
5.	Ageneotettix deorum	2
6.	Thirty other species	8

Nymphs, 0.64

Idle land

		Percent
1.	Melanoplus mexicanus	75
2.	Melanoplus packardii	6
3.	Melanoplus femur-rubrum	5
4.	Ageneotettix deorum	2
5.	Melanoplus bivittatus	2
6.	Twenty-one other species	10

Nymphs, 2.22

Range

1.	Ageneotettix deorum	25
2.	Melanoplus mexicanus	14
3.	Metator pardalinus	13
4.	Aulocara elliotti	10
5.	Phlibostroma quadrimaculatum	5
6.	Thirty-none other species	33

Nymphs, 5.61

Weeds

1.	Melanoplus mexicanus	76
2.	Melanoplus packardii	7
3.	Melanoplus femur-rubrum	7
4.	Ageneotettix deorum	1
5.	Spharagemon collare	1
6.	Eleven other species	8

Nymphs, none

Meadow

1.	Melanoplus mexicanus	41
2.	Camnula pellucida	10
3.	Ageneotettix deorum	10
4.	Melanoplus infantilis	5
5.	Metator pardalinus	4
6.	Twenty-seven other species	30

Nymphs, 7.38

Roadside

1.	Melanoplus mexicanus	65
2.	Melanoplus packardii	7
3.	Metator pardalinus	5
4.	Melanoplus bivittatus	4
5.	Ageneotettix deorum	4
6.	Twenty-three other species	15

Nymphs, 1.89

Reversion

1.	Melanoplus mexicanus	47
2.	Trachyrhachis kiowa	17
3.	Camnula pellucida	14
4.	Ageneotettix deorum	4
5.	Melanoplus packardii	3
6.	Eight other species	15

Nymphs, 0

Corn

1.	Melanoplus mexicanus	76
2.	Melanoplus packardii	6
3.	Melanoplus femur-rubrum	5
4.	Melanoplus bivittatus	3
5.	Ageneotettix deorum	2
6.	Nine other species	8

Nymphs, 0

Legumes

1.	Melanoplus mexicanus	72
2.	Melanoplus femur-rubrum	8
3.	Melanoplus bivittatus	7
4.	Melanoplus packardii	5
5.	Ageneotettix deorum	3
6.	Five other species	5

Nymphs, 0

Pasture

1.	Melanoplus mexicanus	46
2.	Melanoplus infantilis	8
3.	Camnula pellucida	6
4.	Ageneotettix deorum	6
5.	Metator pardalinus	5
6.	Nineteen other species	29

Nymphs, 3.87

River bottom

Percent

1. Melanoplus mexicanus ------ 32
2. Ageneotettix deorum ------- 17
3. Aulocara elliotti --------- 9
4. Melanoplus packardii ------ 9
5. Trachyrhachis kiowa ------- 6
6. Eleven other species ------ 27

Nymphs, 0

Percentage of grand total

1. Melanoplus mexicanus -------- 60
2. Ageneotettix deorum ---------- 8
3. Metator pardalinus ---------- 4
4. Camnula pellucida ---------- 4
5. Melanoplus femur-rubrum ------ 3
6. Forty-four other species ---- 21

Nymphs, 2.42

OKLAHOMA

In Oklahoma 9,244 specimens were collected. Of these M. differentialis was by far the most numerous. The worst infestations were in the central and southwestern parts of the State.

Distribution by species of 9,244 specimens collected in Oklahoma, expressed in percentage of total number collected in each habitat

Species	Small grains	Legume	Corn	Pasture	Range	Roadside	River bottom	Weedy patches	Cotton	Miscellaneous	Environment not given	Total specimens	Percentage of grand total
												Number	
Acrolophitus hirtipes Say	--	--	--	0.28	--	--	--	--	--	0.38	--	6	0.06
Aeoloplus turnbulli bruneri Caud.	3.42	--	--	--	--	1.59	2.22	0.86	--	--	--	59	.64
Ageneotettix deorum Scudd.	1.14	0.24	0.27	5.45	2.35	7.37	3.93	1.59	--	.64	1.43	194	2.10
Arphitornus coloradus Thos.	.10	--	--	--	.66	--	.44	.25	--	.38	.16	17	.18
Arphia conspersa Scudd.	--	--	--	--	--	--	--	--	--	.13	--	1	.01
Arphia simplex Scudd.	--	--	--	--	--	--	--	--	--	2.54	--	20	.22
Arphia sulphurea F.	--	--	--	--	--	--	1.33	--	--	.89	--	10	.11
Aulocara elliotti Thos.	12.27	.32	--	3.38	7.12	3.90	42.22	.98	0.16	.76	14.26	493	5.32
Boopedon maculatum Caud.	--	--	--	.56	--	1.01	--	--	.48	--	--	16	.17
Boopedon nubilum Say	--	--	--	--	--	.14	--	--	--	.89	--	8	.09
Brachystola magna Gir.	.29	--	--	--	.15	--	--	.12	--	--	--	6	.06
Chortophaga viridi-fasciata Deg.	--	--	--	--	--	--	--	--	--	7.24	.16	58	.63
Cordillacris occipitalis Thos.	--	--	--	--	.37	--	--	--	--	--	--	5	.05
Dactylotum pictum Thos.	--	--	--	--	--	--	--	--	.16	--	.32	3	.03
Dissosteira carolina L.	--	--	--	--	--	--	--	--	--	8.31	--	66	.71
Dissosteira longipennis Thos	.29	--	--	--	2.06	--	--	--	--	--	--	31	.33
Encoptolophus gallidus subgracilis Caud.	--	--	--	--	--	--	--	--	2.38	--	--	15	.16
Hadrotettix trifasciatus Say	.10	--	--	--	.15	--	--	.25	--	.13	6.02	44	.48
Hesperotettix speciosus Scudd.	1.24	.32	3.34	7.42	3.38	2.46	--	6.47	3.80	.51	2.69	284	3.07
Hesperotettix viridis pratensis Scudd.	--	--	--	--	--	--	--	--	--	--	4.75	30	.32
Hesperotettix viridis Scudd.	--	--	--	--	.29	--	--	--	--	.76	10.30	75	.81
Hippiscus rugosus Scudd.	--	--	--	--	--	--	--	--	--	5.08	--	40	.43
Melanoplus angustipennis Dodge	10.56	2.75	2.14	15.21	15.56	12.28	--	14.95	10.93	.64	12.99	898	9.70
Melanoplus arizonae Scudd.	.57	--	--	--	.88	--	2.67	--	--	2.03	.16	41	.44
Melanoplus bispinosus Scudd.	3.14	3.88	.67	2.63	1.69	8.38	.44	.12	2.53	1.40	1.11	231	2.49
Melanoplus bivittatus Say	3.99	4.53	8.54	3.76	3.82	5.20	5.33	3.92	9.03	--	--	391	4.22
Melanoplus bowditchi bowditchi Scudd.	.10	8.74	.40	--	.73	--	--	--	--	--	--	122	1.32
Melanoplus confusus Scudd.	--	--	--	--	--	--	--	--	--	5.21	--	41	.44

Distribution by species of 9,244 specimens collected in Oklahoma, expressed in percentage of total number collected in each habitat--Continued

Species	Small grains	Legume	Corn	Pasture	Range	Roadside	River bottom	Weedy patches	Cotton	Miscellaneous	Environment not given	Total specimens	Percentage of grand total
												Number	
Melanoplus differentialis Thos.	14.36	40.13	60.08	14.18	8.95	21.82	0.89	29.93	16.00	0.38	0.16	1,807	19.52
Melanoplus femur-rubrum Deg.	--	.08	--	--	--	--	2.22	.37	5.72	--	--	51	.55
Melanoplus flavidus Scudd.	--	--	.67	--	1.17	.14	--	1.59	--	7.87	4.28	124	1.34
Melanoplus foedus foedus Scudd.	.57	--	--	--	.81	--	--	2.21	--	1.91	.16	51	.55
Melanoplus foedus fluviatilis Bruner	--	.89	1.34	12.68	.44	.29	--	2.57	9.03	5.21	--	283	3.06
Melanoplus foedus iselyi Hebard	6.75	4.29	5.21	8.64	2.57	13.01	--	29.19	3.17	14.73	--	689	7.44
Melanoplus glaucipes Scudd.	.95	.24	.13	.19	2.64	1.73	--	6.86	.63	--	--	124	1.34
Melanoplus lakinus Scudd.	.95	--	.13	.09	.51	1.88	3.11	.12	--	--	--	40	.43
Melanoplus mexicanus Sauss.	7.70	15.53	11.61	3.10	1.84	3.03	.44	2.70	17.11	.38	.32	575	6.21
Melanoplus occidentalis Thos.	--	--	--	--	.66	.14	--	--	--	--	--	10	.11
Melanoplus oklahomae Hebard	--	--	--	--	--	--	--	--	--	--	.16	1	.01
Melanoplus packardii Scudd.	11.51	16.10	.80	10.99	16.37	.87	1.78	3.31	8.55	1.91	.32	774	8.36
Melanoplus ponderosus ponderosus Scudd.	--	--	--	--	--	--	--	--	--	1.91	--	15	.16
Melanoplus ponderosus viola Thos.	--	--	--	--	--	--	--	--	--	.13	--	1	.01
Melanoplus regalis Dodge	.48	--	--	--	1.03	--	2.22	.37	--	3.56	2.22	69	.75
Melanoplus scudderi scudderi Uhl.	--	--	--	--	--	--	--	--	--	.38	--	3	.03
Melanoplus texanus Scudd.	--	--	--	--	--	--	--	.37	--	.13	--	4	.04
Mermiria bivittata Serville	--	.08	--	.38	.22	--	--	--	--	.13	--	9	.10
Mermiria maculipennis Brun.	--	.81	--	2.35	1.03	4.62	--	.12	--	3.05	--	106	1.14
Metator pardalinus Sauss.	--	--	--	--	.07	--	.44	--	--	--	.48	5	.05
Orphulella pelidna Burm.	.10	--	--	--	--	--	--	--	--	.64	--	6	.06
Orphulella speciosa Scudd.	--	--	--	--	--	.14	--	--	--	--	--	1	.01
Pardalophora apiculata Harris	--	--	--	--	--	--	--	--	--	.13	--	1	.01
Paratylotropidia brunneri Scudd.	--	--	--	--	--	--	--	.37	--	--	--	3	.03

Distribution by species, of 9,244 specimens collected in Oklahoma, expressed in percentage of total number collected in each habitat--Continued

Species	Small grains	Legumes	Corn	Pasture	Range	Roadside	River bottom	Weedy patches	Cotton	Miscellaneous	Environment not shown	Total specimens	Percentage of grand total
												Number	
Pardalophora haldemanii Scudd.	--	--	--	0.09	0.29	0.14	--	--	--	0.25	--	8	0.09
Pardalophora phoenicoptera Burm.	--	--	--	1.22	--	--	--	--	.32	.25	--	17	.18
Pardalophora saussurei Scudd.	--	--	--	.09	.66	2.31	--	--	--	--	--	26	.28
Paropomala wyomingensis wyomingensis Thos.	--	--	0.09	--	--	--	--	--	--	--	--	1	.01
Phlibostroma quadrimaculatum Thos.	9.80	--	--	2.82	15.71	1.73	27.55	3.55	.16	.38	25.98	618	6.67
Schistocerca americana americana Drury	--	--	--	--	--	--	--	--	--	.89	--	7	.08
Schistocerca lineata Scudd.	--	--	--	--	--	--	--	--	--	5.08	.63	44	.48
Schistocerca obscura F.	--	--	--	--	.07	--	--	.12	.63	--	--	6	.06
Spharagemon collare Scudd.	8.27	0.40	2.00	3.76	4.26	1.16	.44	.74	2.69	.25	2.38	254	2.74
Spharagemon equale Say	.10	--	--	--	.07	--	--	--	--	--	7.60	50	.54
Spharagemon superbum Hebard	--	--	--	--	--	--	--	--	--	--	.16	1	.01
Syrbula admirabilis Uhl.	--	--	--	--	--	--	--	.12	--	.39	--	8	.09
Trachyrhachis kiowa fuscifrons Stal	--	--	--	.09	.66	--	2.22	--	--	--	.16	16	.17
Trachyrhachis kiowa Thos.	.10	--	--	.09	.07	--	--	.12	--	--	.63	8	.09
Trimerotropis citrina Scudd.	.19	.57	2.67	.28	--	4.62	--	.74	12.20	2.29	--	165	1.78
Trimerotropis latifasciata laticincta Sauss.	--	--	--	--	.22	--	--	--	--	1.91	--	18	.19
Trimerotropis pallidipennis Burm.	.19	--	--	--	--	--	--	.12	--	1.65	--	16	.17
Xanthippus corrallipes partherinus Scudd.	--	.08	--	.09	.15	--	--	--	--	--	--	4	.04
Nymphs	.76	--	--	--	.29	--	--	.98	--	--	--	20	.22
Total specimens per environment	1,051	1,236	749	1064	1,362	692	225	816	631	787	631	9,244	--

OKLAHOMA

Small grains

	Percent
1. Melanoplus differentialis	14
2. Aulocara elliotti	12
3. Melanoplus packardii	12
4. Melanoplus angustipennis impiger	10
5. Phlibostroma quadrimaculatum	10
6. Twenty-four other species	42

Nymphs, 0.76

Roadside

	Percent
1. Melanoplus differentialis	22
2. Melanoplus foedus iselyi	13
3. Melanoplus angustipennis impiger	12
4. Melanoplus bispinosus	8
5. Ageneotettix deorum	7
6. Twenty-one other species	38

Nymphs, 0

Legumes

1. Melanoplus differentialis	40
2. Melanoplus packardii	16
3. Melanoplus mexicanus	16
4. Melanoplus bowditchi bowditchi	9
5. Melanoplus bivittatus	5
6. Fifteen other species	14

Nymphs, 0

River bottom

1. Aulocara elliotti	42
2. Phlibostroma quadrimaculatum	28
3. Melanoplus bivittatus	5
4. Ageneotettix deorum	4
5. Melanoplus lakinus	3
6. Thirteen other species	18

Nymphs, 0

Corn

1. Melanoplus differentialis	60
2. Melanoplus mexicanus	12
3. Melanoplus bivittatus	9
4. Melanoplus foedus iselyi	5
5. Hesperotettix speciosus	3
6. Twelve other species	11

Nymphs, 0

Weedy patches

1. Melanoplus differentialis	30
2. Melanoplus foedus iselyi	29
3. Melanoplus impiger	10
4. Melanoplus glaucipes	7
5. Hesperotettix speciosus	6
6. Twenty-seven other species	18

Nymphs, 0.98

Pasture

1. Melanoplus angustipennis impiger	15
2. Melanoplus differentialis	14
3. Melanoplus foedus flaviatilis	13
4. Melanoplus packardii	11
5. Melanoplus foedus iselyi	9
6. Twenty-one other species	38

Nymphs, 0

Cotton

1. Melanoplus mexicanus	17
2. Melanoplus differentialis	16
3. Trimerotropis citrina	12
4. Melanoplus angustipennis impiger	11
5. Melanoplus bivittatus	9
6. Fifteen other species	35

Nymphs, 0

OKLAHOMA--Continued

Range

Percent

1. Melanoplus packardii --------16
2. Phlibostroma quadrimaculatum 16
3. Melanoplus angustipennis impiger ----------11
4. Melanoplus differentialis --- 9
5. Aulocara elliotti ---------- 7
6. Thirty-four other species ---48
Nymphs, 0.29

Miscellaneous

Percent

1. Melanoplus foedus iselyi ------15
2. Dissosteira carolina ---------- 8
3. Melanoplus flavidus ---------- 8
4. Chortophaga viridi-fasciata --- 7
5. Melanoplus confusus ---------- 5
6. Thirty-nine other species -----57
Nymphs, 0

Environment not shown

1. Phlibostroma quadrimaculatum 26
2. Aulocara elliotti ---------- 14
3. Melanoplus impiger --------- 13
4. Hesperotettix viridis ------ 10
5. Spharagemon equale --------- 8
6. Twenty-two other species --- 29
Nymphs, 0

Percentage of grand total

1. Melanoplus differentialis ----20
2. Melanoplus packardii --------- 8
3. Melanoplus foedus iselyi ----- 7
4. Melanoplus angustipennis impiger ---------- 7
5. Phlibostroma quadrimaculatum - 7
6. Sixty-six other species ------51
Nymphs, 0.22

SOUTH DAKOTA

Of the 12,772 specimens collected in South Dakota about 46 percent were Melanoplus mexicanus. This species hatched out in 1938 in great numbers in idle land, stubble, and peppergrass prairie land adjacent to crops. One field of untenanted reverted land averaged over 1,500 per square yard on 160 acres--enough hoppers to destroy all of the grain on 15 sections. Some of the peppergrass prairie had populations of 8,000 per square yard. Such dense populations thin out to at least 40 to 50 per square yard by the time the hoppers are adult, chiefly by spreading. Most farmers are reluctant to poison hoppers on land belonging to other people or on untenanted reverted land. They should realize that hoppers do not respect property lines any more than they do property rights. Where such places are a menance to adjacent farms poisoning them off before they get into the crops becomes a community problem.

Distribution by species of 12,772 specimens collected in South Dakota, expressed in percentage of total number collected in each habitat

Species	Small grains	Roadside	Pasture	Legumes	Weeds	Range	River bottom	Environment not given	Reversion	Meadow	Corn	Total specimens	Percentage of grand total
												Number	
Acrolophitus hirtipes Say	--	--	--	--	--	0.04	--	--	--	--	--	1	0.01
Aeoloplus turnbulli bruneri Caud.	2.45	1.08	5.17	0.43	1.40	.70	1.86	0.58	3.83	--	1.51	226	1.76
Aeropedellus clavatus Thos.	.02	--	--	--	--	.70	--	.58	.96	--	--	23	.18
Ageneotettix deorum Scudd.	3.38	3.39	13.93	5.46	5.14	14.98	3.49	2.32	19.61	27.77	1.51	1,076	8.40
Amphitornus coloradus Thos.	--	.17	2.84	.25	--	2.31	.23	.29	6.70	.47	--	118	.92
Arphia pseudonietana Thos.	--	--	--	--	--	--	--	--	--	.31	--	2	.02
Aulocara elliotti Thos.	2.74	1.74	7.26	.31	8.41	21.39	.70	4.93	10.52	1.87	1.51	849	6.62
Boopedon nubilum Say	--	.08	--	.19	--	1.21	--	--	--	--	--	35	.27
Brachystola magna Gir.	--	.08	--	.06	--	.08	.23	--	--	--	--	5	.04
Camnula pellucida Scudd.	.14	.25	.25	.12	--	.16	--	--	2.39	1.72	--	34	.27
Chloealtis conspersa Harr.	--	.08	--	--	--	--	--	--	--	--	--	1	.01
Chorthippus longicornis Latr.	--	.08	--	.06	--	--	--	.29	--	2.18	--	17	.13
Cordillacris crenulata Brun.	--	--	--	--	--	1.29	--	--	--	--	--	33	.26
Cordillacris occipitalis Thos.	--	.25	.50	--	--	.39	--	--	--	--	--	19	.15
Dactylotum pictum Thos.	--	--	--	--	--	--	--	.29	--	--	--	1	.01
Derotmema haydenii Thos.	.02	.41	1.17	.25	--	.12	--	--	.48	--	.50	29	.23
Diapheromera femorata Say	--	--	--	--	--	.43	--	--	--	--	--	11	.09
Diapheromera velii Walsh	--	--	--	--	--	.04	--	--	--	--	--	1	.01
Dissosteira carolina L.	.86	.17	.17	.12	.47	--	.47	--	--	--	--	45	.35
Dissosteira longipennis Thos.	.05	--	--	--	.47	--	--	--	--	--	--	3	.02
Drepanopterna femoratum Scudd.	--	.08	.25	--	--	.70	--	--	--	--	--	22	.17
Eritettix simplex tricarinatus Thos.	--	--	.08	--	--	--	--	--	--	--	--	1	.01
Hadrotettix trifasciatus Say	.29	.17	.08	.19	--	.08	.23	--	--	.16	1.01	24	.19
Hesperotettix speciosus Scudd.	.10	--	.08	.12	--	.04	1.40	--	--	.16	--	15	.12
Hesperotettix viridis Thos.	.07	.91	--	.12	--	.35	--	1.74	--	1.72	--	42	.33
Hippiscus rugosus Scudd.	--	--	--	--	--	--	--	.29	--	--	--	1	.01
Hypochlora alba Dodge	.02	--	--	--	--	.08	--	--	--	--	--	3	.02
Melanoplus angustipennis Dodge	.58	1.32	.75	.12	--	.16	2.33	--	.48	.16	3.02	73	.57
Melanoplus bivittatus Say	5.14	6.38	1.50	6.09	3.74	.59	9.07	6.67	--	5.30	7.54	541	4.22
Melanoplus confusus Scudd.	1.06	3.39	2.75	.43	1.87	2.15	5.58	.29	1.44	2.18	1.01	228	1.78
Melanoplus dawsoni Scudd.	.02	1.57	--	.12	--	.12	--	--	--	4.37	--	53	.41

Distribution by species of 12,772 specimens collected in South Dakota, expressed in percentage of total number collected in each habitat--Continued

Species	Small grains	Roadside	Pasture	Legumes	Weeds	Range	River bottom	Environment not given	Reversion	Meadow	Corn	Total specimens	Percentage of grand total
												Number	
Melanoplus differentialis Thos.	3.94	1.49	0.92	4.84	0.93	0.23	3.02	--	--	0.31	5.53	303	2.36
Melanoplus fasciatus Walk.	--	--	--	--	--	--	--	2.32	--	--	--	8	.06
Melanoplus femur-rubrum Deg.	2.14	10.85	5.42	19.75	23.83	.20	7.21	10.14	0.96	5.93	.50	766	5.97
Melanoplus flavidus Scudd.	--	--	--	--	--	.04	--	.29	--	--	--	2	.02
Melanoplus foedus fluviatilis Brun.	.08	--	.25	--	--	7.21	--	--	--	--	--	36	.28
Melanoplus foedus foedus Scudd.	.02	--	--	--	--	--	--	--	--	--	--	1	.01
Melanoplus gladstoni Scudd.	--	--	.42	1.37	--	--	.23	--	--	.31	--	30	.23
Melanoplus infantilis Scudd.	.12	.83	.33	.12	.47	1.06	.70	.29	.96	.78	--	60	.47
Melanoplus lakinus Scudd.	1.73	--	.58	.19	.47	.08	--	--	--	--	3.52	92	.72
Melanoplus mexicanus Sauss.	66.41	40.82	45.12	52.16	38.31	14.82	49.99	48.98	45.93	27.61	61.31	5,881	45.87
Melanoplus occidentalis Thos.	.05	.17	.08	.06	2.80	2.82	--	--	--	.78	.50	90	.70
Melanoplus packardii Scudd.	4.49	10.10	2.34	1.37	2.80	1.64	1.63	1.45	2.39	1.72	8.04	451	3.52
Mermiria maculipennis Brun.	.14	.08	.08	.12	--	.47	.70	4.93	--	.47	.50	46	.36
Melanoplus dodgei Thos.	--	--	--	--	--	--	--	.29	--	--	--	1	.01
Metator pardalinus Sauss.	.22	.41	.42	.31	--	.51	--	--	1.44	1.56	--	50	.39
Opeia obscura Thos.	.02	--	.08	--	--	.04	--	--	--	--	--	3	.02
Orphulella pelidna Burm.	--	--	--	--	--	.04	--	--	--	--	--	1	.01
Orphulella speciosa Scudd.	--	--	.08	.06	.47	.27	1.40	.29	--	--	--	17	.13
Pardalophora haldemanii Scudd.	.05	.17	--	--	--	--	.23	.29	--	.16	--	7	.05
Phlibostroma quadrimaculatum Thos.	--	.25	--	--	--	1.41	--	.29	--	--	--	40	.31
Phoetaliotes nebrascensis Thos.	.05	.17	.08	.12	--	.04	.23	.29	--	.94	--	16	.12
Spharagemon collare Scudd.	.24	.25	.42	.06	--	--	.23	--	--	.16	1.01	23	.18
Spharagemon equale Say	.29	.17	.08	.06	--	.16	--	.58	.96	--	.50	25	.20
Trachyrhachis kiowa Thos.	.05	.08	3.75	2.98	.47	2.07	1.40	--	.96	2.18	--	172	1.34
Nymphs	3.04	12.67	2.75	1.80	7.94	25.92	.23	11.30	--	8.74	1.01	1,119	8.73
Total specimens per environment	4,163	1,207	1,199	1,610	214	2,555	430	345	209	641	199	12,772	--

SOUTH DAKOTA

Small grains

		Percent
1.	Melanoplus mexicanus	66
2.	Melanoplus bivittatus	5
3.	Melanoplus packardii	4
4.	Melanoplus differentialis	4
5.	Ageneotettix deorum	3
6.	Twenty-eight other species	18

Nymphs, 3.04

Range

		Percent
1.	Aulocara elliotti	21
2.	Ageneotettix deorum	15
3.	Melanoplus mexicanus	15
4.	Melanoplus occidentalis	3
5.	Amphitornus coloradus	2
6.	Thirty-six other species	44

Nymphs, 25.92

Roadside

1.	Melanoplus mexicanus	41
2.	Melanoplus femur-rubrum	11
3.	Melanoplus packardii	10
4.	Melanoplus bivittatus	6
5.	Ageneotettix deorum	3
6.	Twenty-nine other species	29

Nymphs, 12.67

Meadow

1.	Melanoplus mexicanus	28
2.	Ageneotettix deorum	27
3.	Melanoplus femur-rubrum	6
4.	Melanoplus bivittatus	5
5.	Melanoplus dawsoni	4
6.	Twenty-three other species	30

Nymphs, 8.74

Pasture

1.	Melanoplus mexicanus	45
2.	Ageneotettix deorum	14
3.	Aulocara elliotti	7
4.	Melanoplus femur-rubrum	5
5.	Aeoloplus turnbulli	5
6.	Twenty-eight other species	24

Nymphs, 2.75

Corn

1.	Melanoplus mexicanus	61
2.	Melanoplus packardii	8
3.	Melanoplus bivittatus	8
4.	Melanoplus differentialis	6
5.	Melanoplus lakinus	4
6.	Thirteen other species	13

Nymphs, 1.01

Legumes

1.	Melanoplus mexicanus	52
2.	Melanoplus femur-rubrum	20
3.	Melanoplus bivittatus	6
4.	Ageneotettix deorum	5
5.	Melanoplus differentialis	5
6.	Twenty-nine other species	12

Nymphs, 1.80

River botton

1.	Melanoplus mexicanus	50
2.	Melanoplus bivittatus	9
3.	Melanoplus femur-rubrum	7
4.	Melanoplus foedus fluviatilis	7
5.	Melanoplus confusus	6
6.	Twenty other species	21

Nymphs, 0.23

Weeds

1.	Melanoplus mexicanus	38
2.	Melanoplus femur-rubrum	24
3.	Aulocara elliotti	8
4.	Ageneotettix deorum	5
5.	Melanoplus bivittatus	4
6.	Twelve other species	21

Nymphs, 7.94

Environment not given

1.	Melanoplus mexicanus	49
2.	Melanoplus femur-rubrum	10
3.	Melanoplus bivittatus	7
4.	Aulocara elliotti	5
5.	Mermiria maculipennis	5
6.	Twenty other species	24

Nymphs, 11.30

SOUTH DAKOTA -- Continued

Reversion		Percentage of grand total	
	Percent		
1. Melanoplus mexicanus	46	1. Melanoplus mexicanus	46
2. Ageneotettix deorum	20	2. Ageneotettix deorum	8
3. Aulocara elliotti	11	3. Aulocara elliotti	7
4. Amphitornus coloradus	7	4. Melanoplus femur-rubrum	6
5. Aeoloplus turnbulli	4	5. Melanoplus bivittatus	4
6. Eleven other species	12	6. Fifty-two other species	29
Nymphs, 0			

TEXAS

Only 1,005 specimens were collected in Texas. This is not a fair sample of the hoppers for the largest State in the Union; therefore the relative numbers of the different species as shown here are not conclusive. Melanoplus differentialis was the dominant species along the Red River and in the central part of the State. Dissosteira longipennis was the most numerous species found in the extreme northwestern part, or Panhandle.

Distribution of species of 1,005 specimens collected in Texas, expressed in percentage of total number collected in each habitat

Species	Small grains	Range	Roadside	Grassland	Environment not shown	Total specimens	Percentage of grand total
						Number	
Aecloplus turnbulli Thos.	1.20	--	--	--	--	3	0.30
Ageneotettix deorum Thos.	.40	--	0.91	1.33	--	5	.50
Aulocara elliotti Thos.	14.00	31.67	14.16	3.33	33.43	199	19.80
Cordillacris crenulata Brun.	.80	--	6.39	--	--	16	1.59
Decticinae	--	--	3.65	--	--	8	.80
Drepanopterna femoratum Scudd.	--	5.00	1.37	--	--	6	.60
D. longipennis Thos.	--	1.67	1.37	--	1.34	10	1.00
Encoptolophus pallidus subgracilis Caud.	.40	--	--	--	.31	2	.20
Hadrotettix trifasciatus Say	--	1.67	--	--	1.23	5	.50
Hesper. speciosus Scudd.	--	--	--	2.67	.31	5	.50
Melanoplus arizonae Scudd.	2.80	--	.91	--	1.53	14	1.39
Melanoplus bivittatus Say	2.40	--	--	--	--	6	.60
Melanoplus differentialis Thos.	50.40	--	.91	--	1.53	133	13.23
Melanoplus femur-rubrum Deg.	--	--	.46	--	--	1	.10
Melanoplus fluviatilis Brun.	--	--	--	--	2.45	8	.80
Melanoplus flavidus Scudd.	1.60	--	--	--	--	4	.40
Melanoplus impiger Scudd.	.80	--	--	--	.31	3	.30
Melanoplus lakinus Scudd.	6.00	--	--	.67	.92	19	1.89
Melanoplus mexicanus Sauss.	3.60	1.67	--	--	3.68	22	2.19
Melanoplus occidentalis Thos.	--	5.00	--	--	--	3	.30
Melanoplus packardii Scudd.	6.40	11.67	5.94	--	7.05	59	5.87
Melanoplus regalis Dodge	1.60	1.67	6.39	3.33	3.07	34	3.38
Mermiria maculipennis Brun.	--	--	2.74	--	--	6	.60
Mermiria sp.	--	--	--	.67	--	1	.10
Nymphs	--	5.00	6.39	--	--	17	1.69
Opeia obscura Thos.	--	--	1.83	--	--	4	.40
Phlibostroma quadrimaculatum Thos.	2.00	35.00	40.64	85.32	37.72	366	36.42
Schistocerca lineata Scudd.	--	--	--	--	.61	2	.20
Syrbula admirabilis Uhl.	--	--	--	.67	--	1	.10
Spharagemon collare Scudd.	.80	--	.91	--	.61	6	.60
Spharagemon equale Say	--	--	--	--	.61	2	.20
Trachyrhachis kiowa Thos.	4.40	--	4.57	2.00	2.76	33	3.28
Xanthippus corallipes Hald.	.40	--	.46	--	--	2	.20
Total specimens per environment	250	60	219	150	326	1,005	--

TEXAS

Small grains

		Percent
1.	Melanoplus differentialis	50
2.	Aulocara elliotti	14
3.	Melanoplus packardii	6
4.	Melanoplus lakinus	6
5.	Trachyrhachis kiowa	4
6.	Thirteen other species, adults	20
	Nymphs, none	

Grassland

		Percent
1.	Phlibostroma quadrimaculatum	85
2.	Aulocara elliotti	3
3.	Melanoplus regalis	3
4.	Hesper. speciosus	2
5.	Trachyrhachis kiowa	2
6.	Four other species, adults	5
	Nymphs, none	

Range

1.	Phlibostroma quadrimaculatum	35
2.	Aulocara elliotti	31
3.	Melanoplus packardii	11
4.	Drepanopterna femoratum	5
5.	Melanoplus occidentalis	5
6.	Five other species, adults	13
	Nymphs, 5.	

Environment not shown

1.	Phlibostroma quadrimaculatum	37
2.	Aulocara elliotti	33
3.	Melanoplus packardii	7
4.	Melanoplus mexicanus	3
5.	Melanoplus regalis	3
6.	Thirteen other species, adults	17
	Nymphs, none	

Roadside

1.	Phlibostroma quadrimaculatum	40
2.	Aulocara elliotti	14
3.	Melanoplus regalis	6
4.	Cordillacris crenulata	6
5.	Melanoplus packardii	5
6.	Thirteen other species, adults	29
	Nymphs, 6.37	

Percentage of grand total

1.	Phlibostroma quadrimaculatum	36
2.	Aulocara elliotti	19
3.	Melanoplus differentialis	13
4.	Melanoplus packardii	5
5.	Melanoplus regalis	3
6.	Twenty-eight other species	24
	Nymphs, 1.69	

UTAH

Of the 5,669 specimens collected in Utah, Melanoplus femur-rubrum formed 69 percent, with M. mexicanus second at 18 percent. The most severe infestations were in the north-central part of the State, alfalfa fields containing the most hoppers. M. femur-rubrum increased its importance over the other species from 28 percent in 1936 to 69 percent in 1937.

Distribution by species of 5,669 specimens collected in Utah, expressed in percentage of total number collected in each habitat

Species	Legumes	Small grains	Pasture	Corn	Range	Truck Crops	Environment not shown	Total specimens	Percentage of grand total
								Number	
Ageneotettix deorum Scudd.	0.14	--	--	--	--	--	--	7	0.12
Arphia pseudonietana Thos.	.69	.97	--	--	--	--	--	39	.69
Aulocara elliotti Thos.	.18	.19	--	--	--	--	--	10	.18
Camnula pellucida Scudd.	.14	.58	20.24	--	7.69	--	--	28	.49
Chorthippus longicornis Latr.	.30	--	2.38	--	--	--	--	17	.30
Dissosteira carolina L.	.57	1.17	7.14	--	--	--	1.58	41	.72
Dissosteira spurcata Sauss.	.10	--	--	--	--	--	--	5	.09
Drepanopterna femoratum Scudd.	.16	.39	--	--	--	--	--	10	.18
Hesperotettix viridis Thos.	.08	--	--	--	--	--	--	4	.07
Melanoplus bivittatus Say.	1.98	1.75	2.38	--	7.69	--	9.46	116	2.04
Melanoplus dawsoni Scudd.	.16	--	--	--	--	--	--	8	.14
Melanoplus differentialis Thos.	.04	--	--	--	--	--	--	2	.04
Melanoplus femur-rubrum Deg.	69.99	70.94	53.57	36.17	23.08	93.33	--	3,908	68.78
Melanoplus infantilis Scudd.	.02	--	--	--	--	--	--	1	.02
Melanoplus keeleri luridus Dodge	1.03	3.90	--	2.13	--	--	--	72	1.27
Melanoplus mexicanus Sauss.	18.77	14.42	2.38	19.15	15.38	--	29.97	1,035	18.22
Melanoplus packardii Scudd.	3.41	3.90	2.38	6.38	15.38	--	50.47	228	4.01
Mermiria maculipennis Brun.	.02	--	--	--	--	--	3.15	3	.05
Orphulella desereta Scudd.	.02	--	2.38	--	--	--	--	3	.05
Phoetaliotes nebrascensis Thos.	.33	--	--	--	--	--	4.73	22	.39
Pseudoponala brachyptera Scudd.	.02	--	--	--	--	--	--	1	.02
Schistocerca lineata Scudd.	.10	.19	--	36.17	--	6.67	--	24	.42
Spharagemon collare Scudd.	.02	.19	1.19	--	--	--	--	3	.05
Spharagemon equale Say	.02	.19	--	--	--	--	--	2	.04
Trachyrhachis kiowa Thos.	.24	--	--	--	--	--	--	12	.21
Trimerotropis pallidipennis Burm.	.59	1.17	5.95	--	23.08	--	--	43	.77
Trimerotropis gracilis Thos.	--	--	--	--	7.69	--	--	1	.02
Trimerotropis strenua McN.	.12	--	--	--	--	--	--	6	.11
Nymphs	.36	--	--	--	--	--	--	18	.32
Total specimens per environment	4,934	513	84	47	13	15	63	5,669	--

UTAH

Legumes

		Percent
1.	Melanoplus femur-rubrum	70
2.	Melanoplus mexicanus	19
3.	Melanoplus packardii	3
4.	Melanoplus bivittatus	2
5.	Melanoplus keeleri luridus	1
6.	Twenty-two other species	5
	Nymphs, 0	

Range

		Percent
1.	Melanoplus femur-rubrum	23
2.	Trimerotropis pallidipennis	23
3.	Melanoplus mexicanus	15
4.	Melanoplus packardii	15
5.	Camnula pellucida	8
6.	Two other species	16
	Nymphs, 0	

Small grains

1.	Melanoplus femur-rubrum	71
2.	Melanoplus mexicanus	14
3.	Melanoplus keeleri luridus	4
4.	Melanoplus packardii	4
5.	Melanoplus bivittatus	2
6.	Nine other species	5
	Nymphs, 0	

Truck crops

1.	Melanoplus femur-rubrum	93
	Schistocerca lineata	7
	Nymphs, 0	

Pastures

1.	Melanoplus femur-rubrum	54
2.	Camnula pellucida	20
3.	Dissosteira carolina	7
4.	Trimerotropis pallidipennis	6
5.	Chorthippus longicornis	2
6.	Five other species	11
	Nymphs, 0	

Environment not given

1.	Melanoplus packardii	50
2.	Melanoplus mexicanus	30
3.	Melanoplus bivittatus	9
4.	Phoetaliotes nebrascensis	5
5.	Mermiria maculipennis	3
6.	One other species	2
	Nymphs, 0	

Corn

1.	Melanoplus femur-rubrum	36
2.	Schistocerca lineata	36
3.	Melanoplus mexicanus	19
4.	Melanoplus packardii	6
5.	Melanoplus keeleri luridus	2
	Nymphs, 0	

Percentage of grand total

1.	Melanoplus femur-rubrum	69
2.	Melanoplus mexicanus	18
3.	Melanoplus packardii	4
4.	Melanoplus bivittatus	2
5.	Melanoplus keeleri luridus	1
6.	Twenty-four other species	6
	Nymphs, 0.32	

WISCONSIN

Only a few specimens were collected in Wisconsin in 1937. Of the 242 taken, Melanoplus mexicanus was the most numerous. This was substantiated by the hatch in 1938 which showed M. mexicanus to be dominant over a large part of the State. M. femur-rubrum was second in importance. The infestations were in threatening numbers over most of the State, except in a few central counties.

Distribution by species of 242 specimens collected in Wisconsin, expressed in percentage of total number collected in each habitat

Species	Pasture (stump)	Meadow	Roadside	Total specimens	Percentage of grand total
				Number	
Camnula pellucida Scudd.	2.00	2.08	--	4	1.65
Chort. longicornis Harr.	1.00	2.08	2.17	4	1.65
Melanoplus bivittatus Say	--	--	2.17	1	0.41
Melanoplus dawsoni Scudd.	--	3.13	--	3	1.24
Melanoplus femur-rubrum Deg.	71.00	4.17	13.04	81	33.47
Melanoplus mexicanus Sauss.	26.00	88.54	82.61	149	61.57
Total specimens per environment	100	96	46	242	--

Pasture (stump)

		Percent
1.	Melanoplus femur-rubrum----	71
2.	Melanoplus mexicanus-------	26
3.	Camnula pellucida----------	2
4.	Chort. longicornis---------	1

No other species

Meadow

1.	Melanoplus mexicanus-------	89
2.	Melanoplus femur-rubrum----	4
3.	Melanoplus dawsoni---------	3
4.	Camnula pellucida----------	2
5.	Chorthippus longicornis-----	2

Roadside

		Percent
1.	Melanoplus mexicanus--------	83
2.	Melanoplus femur-rubrum-----	13
3.	Chort. longicornis----------	2
4.	Melanoplus bivittatus-------	2

No other species

Percentage of grand total

1.	Melanoplus mexicanus--------	61
2.	Melanoplus femur-rubrum-----	33
3.	Camnula pellucida----------	2
4.	Chort. longicornis----------	2
5.	Melanoplus dawsoni----------	1
6.	One other species----------	1

WYOMING

The collections for Wyoming were the most complete of all. There were 37,628 specimens collected, of which Melanoplus mexicanus was first in numbers, M. femur-rubrum second, M. bivittatus third, and Camnula pellucida fourth. Severe infestations were present in 12 counties in the northern and eastern parts of the State where most of the farming is done. There was practically no change over 1936 in the relative numbers of the first three important species. Rains in the first 2 weeks of June held outbreaks in check.

Distribution by species of 37,628 specimens collected in Wyoming, expressed in percentage of total number collected in each habitat

Species	Legumes	Small grains	Range	Roadside	Reversion	River bottom	Mixed fields	Meadows	Pasture	Weeds and sage	Idle land	Abandoned field	Env. not shown	Specimens	Percentage of grand total
														Number	
Aeoloplus turnbulli Thos.	0.95	2.83	0.72	14.99	13.42	0.29	0.74	0.29	0.90	1.63	--	--	--	690	1.79
Acrolophitus hirtipes Say	-	.04	.08	-	-	.03	-	-	-	.09	-	-	-	9	.02
Ageneotettix deorum Scudd.	.73	1.99	11.59	2.51	1.57	6.55	7.13	6.95	4.04	9.59	7.49	25.81	-	1,542	4.02
Aeropedellus clavatus Thos.	-	-	.04	-	-	-	-	.07	-	-	-	-	-	2	.01
Arphia pseudonietana Thos.	.02	-	.02	-	-	.03	-	.14	-	-	-	-	-	7	.02
Aulocara elliotti Thos.	1.30	4.36	17.75	4.63	1.34	12.73	7.01	3.51	2.70	7.69	10.77	27.42	3.39	2,332	6.06
Anabrus simplex Hald.	-	-	-	-	-	-	-	-	-	.09	-	-	-	1	.01
Amphitornus coloradus Thos.	.11	.49	2.21	.08	.45	1.07	.74	2.29	-	1.09	-	6.45	-	274	.71
Brachystola magna Gir.	.01	-	-	-	-	.05	-	-	-	-	-	-	-	4	.01
Bruneria brunnea Thos.	-	.04	2.20	-	-	.03	2.83	.07	-	-	-	-	-	167	.43
Boopedon sp.	-	.01	-	-	-	-	-	-	-	.45	-	-	-	6	.02
Camnula pellucida Scudd.	5.97	7.65	4.95	17.41	-	7.60	12.36	21.91	45.29	9.96	.47	12.90	6.78	2,952	7.68
Chorthippus longicornis Latr.	.17	.03	.17	.39	-	.16	1.17	1.15	.45	.54	-	-	-	8	.23
Cordillacris crenulata Brun.	.01	-	1.70	.08	-	.10	-	.07	-	-	-	-	-	97	.25
Cratypedes neglectus Thos.	-	-	.11	-	-	.03	-	-	-	.09	-	-	-	8	.02
Cord. occipitalis Thos.	-	.08	2.29	1.02	-	.13	.06	-	-	-	-	-	-	146	.38
Derotmema haydenii Thos.	.26	.32	.89	.31	.89	.18	.49	.21	.45	.27	-	-	-	139	.36
Dissosteira carolina L.	.65	.57	.08	.08	.22	.29	.12	-	-	-	-	-	-	156	.41
Drepanopterna femoratum Scudd.	.08	.21	4.10	.08	-	2.96	.37	1.22	2.24	.63	-	-	-	394	1.02
Dactylotum pictum Thos.	.01	-	.04	-	-	.03	-	.21	-	-	-	-	-	7	.02
Encoptolophus sordidus costalis Scudd.	.07	-	.43	-	-	.86	.12	2.22	--	-	-	-	-	99	.26
Hadrotettix trifasciatus Say.	.14	.30	.96	1.02	.45	.68	.49	.43	--	.54	.47	4.84	-	160	.42
Hesperotettix viridis Thos.	.12	.26	2.12	.08	.22	.37	.37	.21	--	1.36	.23	-	-	190	.49
Hypochlora alba Dodge	.01	-	.04	-	-	.18	.06	-	2.69	.09	-	-	-	19	.05
Melanoplus angustipennis Dodge	3.02	3.99	.36	3.84	8.50	2.44	6.46	.29	6.28	1.45	3.28	--	-	1,093	2.84
Melanoplus alpinus Scudd.	-	0	.13	-	-	-	-	-	-	.36	-	-	-	11	.03
Melanoplus bivittatus Say	15.74	7.16	.89	6.35	6.04	12.63	14.76	12.03	1.79	4.25	1.37	-	5.08	3,910	10.17
Melanoplus bruneri Scudd.	-	-	.55	-	-	1.07	-	.72	-	-	-	-	-	80	.21
Melanoplus bowditchi Scudd.	.69	.70	.96	.47	.45	--	1.78	-	.90	2.08	.47	-	-	267	.69
Melanoplus borealis Fieber	-	-	.06	.47	-	-	-	6.30	-	-	-	-	-	97	.25
Melanoplus confusus Scudd.	.05	.01	.15	.08	-	.08	-	.29	-	1.09	-	-	-	36	.09
Melanoplus dawsoni Scudd.	.08	.01	.25	-	-	.10	.18	.43	-	.63	-	-	-	46	.12
Melanoplus differentialis Thos.	2.26	2.63	-	.24	1.12	.42	.06	.64	-	.09	-	-	-	562	1.46

Distribution by species of 37,628 specimens collected in Wyoming, expressed in percentage of total number collected in each habitat--Continued

Species	Legumes	Small grains	Range	Roadside	Reversion	River bottom	Mixed fields	Meadows	Pasture	Weeds and sage	Idle land	Abandoned field	Env. not shown	Specimens	Percentage of grand total
														Number	
Melanoplus flavidus Scudd.	0.05	0.13	0.55	--	--	0.18	--	--	--	--	--	--	21	0.05
Melanoplus femur-rubrun Deg.	24.17	10.62	1.57	10.35	1.79	16.98	6.52	9.38	1.35	6.24	--	1.61	--	5,457	14.19
M. foedus foedus Scudd.	1.51	1.86	.36	2.04	13.20	.39	1.72	.36	--	.36	--	--	--	516	1.34
Melanoplus gladstoni Scudd.	.40	.57	.61	.24	--	.13	.12	.50	--	.27	--	--	--	153	.40
Melanoplus fluviatilis Bruner	.04	--	--	--	.22	.16	--	--	--	--	--	--	--	12	.03
Melanoplus infantilis Scudd.	.65	1.32	6.09	.63	1.79	1.76	.37	.50	.90	1.72	2.34	--	--	644	1.67
Melanoplus keeleri luridus Dodge	--	--	--	--	--	--	--	.21	--	--	--	--	--	3	.01
Melanoplus kennicotti Scudd.	.03	.68	--	--	--	--	--	--	--	.09	--	--	--	39	.10
Melanoplus mexicanus Sauss.	23.23	41.71	12.34	21.32	31.77	19.89	26.57	10.74	21.97	30.86	67.65	12.90	79.66	9,693	25.20
Melanoplus occidentalis Thos.	.08	.48	3.70	1.02	1.34	1.26	.31	.29	.45	1.18	--	--	--	334	.87
Melanoplus packardii Sauss.	4.11	4.27	2.74	2.59	9.34	2.75	3.32	1.36	.90	5.52	3.28	6.45	5.08	1,402	3.65
Melanoplus sp.	--	--	3.08	--	--	--	--	--	--	--	--	--	--	163	.42
Melanoplus oregonensis Thos.	--	--	--	--	--	--	--	--	--	5.34	--	--	--	59	.15
Mermiria maculipennis Brun.	--	.15	--	--	--	.08	--	--	--	--	--	--	--	11	.03
Mermiria maculipennis macclungi Rehn.	--	--	--	.16	--	--	--	--	--	--	--	--	--	2	.01
Metator pardalinus Sauss.	.11	.43	1.98	1.18	--	1.31	1.17	7.45	--	.54	.70	--	--	351	.91
Nopodismopsis abdominalis Thos.	--	--	.21	--	--	--	.06	--	--	--	--	--	--	12	.03
Orphulella speciosa Scudd.	--	--	.31	--	--	--	--	2.00	--	--	--	--	--	32	.08
Orphulella pelidna Burm.	.02	--	--	--	--	.39	--	.57	--	--	--	--	--	26	.07
Opeia obscura Thos.	.19	.01	.02	1.88	.22	1.05	.06	.14	.90	.27	--	--	--	115	.30
Pardalophora haldemanii Scudd.	--	.01	.08	--	--	--	--	--	.45	--	--	--	--	6	.02

Distribution by species of 37,628 specimens collected in Wyoming, expressed in percentage of total number collected in each habitat--Continued

Species	Legumes	Small grains	Range	Roadside	Reversion	River bottom	Mixed fields	Meadows	Pasture	Weeds and sage	Idle land	Abandoned field	Env. not shown	Specimens: Number	Percentage of grand total
Phlibostroma quadrimaculatum Thos.	0.01	0.08	5.71	0.31	1.12	0.58	0.25	0.72	--	0.54	--	1.61	--	362	0.94
Phoetaliotes nebrascensis Thos.	.03	.05	.13	.08	--	.53	--	.29	--	.09	--	--	--	51	.13
Pseudopomalo brachyptera Scudd.		.02	--	--	--	--	--	--	--	--	--	--	--	1	.01
Schistocerca lineata Scudd.	--	.08	--	--	--	--	.06	1.29	--	--	--	--	--	23	.06
Spharagemon collare Scudd.	.48	.92	.13	.31	2.91	.71	1.41	--	--	.18	.23	--	--	217	.56
Spharagemon equale Say.	.05	.19	.55	.39	.45	.24	.12	.07	--	.27	.47	--	--	75	.20
Tettigoniidae	.03	--	--	--	--	--	--	--	--	--	--	--	--	11	.03
Trachyrhachis kiowa Thos.	.08	.09	1.74	.24	--	.63	.18	.93	1.79	.27	--	--	--	160	.42
Trimerotropis sparsa Thos.	--	--	.04	--	--	.03	--	--	--	--	--	--	--	3	.01
Trimerotropis laticincta Sauss.	.01	.04	--	.31	--	--	.06	--	--	--	.23	--	--	11	.03
Trimerotropis campestris McN.	--	--	--	--	--	--	--	--	--	.09	--	--	--	1	.01
Trimerotropis pallidipennis Burm.	--	.01	--	--	--	--	--	--	.90	--	--	--	--	3	.01
Trimerotropis pistrinaria Sauss.		.02	.08	--	--	--	.06	--	--	--	--	--	--	3	.01
Trimerotropis gracilis Thos.	--	--	--	--	--	--	--	--	1.35	--	--	--	--	3	.01
Nymphs	11.95	3.01	.91	1.88	.45	--	--	1.43	1.35	1.99	--	--	--	2,059	5.35
Undetermined	.01	--	--	--	--	--	--	--	--	--	--	--	--	1	.01
Anabrus simplex Hald.	--	--	--	--	.22	--	--	.07	--	--	--	--	--	2	.01
Total specimens per environment	14,224	7,704	5,268	1,274	447	3,816	1,624	1,396	223	1,104	427	62	59	37,628	----

WYOMING

Legumes

		Percent
1.	Melanoplus femur-rubrum	24
2.	Melanoplus mexicanus	23
3.	Melanoplus bivittatus	16
4.	Camnula pellucida	6
5.	Melanoplus packardii	4
6.	Thirty-nine other species	27

Nymphs, 11.95
Undetermined adults, 0.01

River bottom

		Percent
1.	Melanoplus mexicanus	20
2.	Melanoplus femur-rubrum	17
3.	Aulocara elliotti	13
4.	Melanoplus bivittatus	13
5.	Camnula pellucida	8
6.	Forty other species	29

Nymphs, 0
Undetermined adults, 0

Small grains

1.	Melanoplus mexicanus	42
2.	Melanoplus femur-rubrum	11
3.	Camnula pellucida	8
4.	Melanoplus bivittatus	7
5.	Melanoplus packardii	4
6.	Thirty-eight other species	28

Nymphs, 3.01
Undetermined, 0

Mixed fields

1.	Melanoplus mexicanus	27
2.	Melanoplus bivittatus	15
3.	Camnula pellucida	12
4.	Aulocara elliotti	7
5.	Ageneotettix deorum	7
6.	Thirty-three other species	32

Nymphs, 0
Undetermined, 0

Range

1.	Aulocara elliotti	18
2.	Melanoplus mexicanus	12
3.	Ageneotettix deorum	12
4.	Phlib. quadrimaculatum	6
5.	Camnula pellucida	5
6.	Fifty-one other species	47

Nymphs, 0.91
Undetermined adults, 0

Meadows

1.	Camnula pellucida	22
2.	Melanoplus bivittatus	12
3.	Melanoplus mexicanus	11
4.	Melanoplus femur-rubrum	9
5.	Metator pardalinus	7
6.	Thirty-seven other species	39

Nymphs, 1.43
Undetermined adults, 0

Roadside

1.	Melanoplus mexicanus	21
2.	Camnula pellucida	17
3.	Acoloplus turnbulli	15
4.	Melanoplus femur-rubrum	10
5.	Melanoplus bivittatus	6
6.	Thirty-four other species	31

Nymphs, 1.38
Undetermined adults, 0

Pasture

1.	Camnula pellucida	45
2.	Melanoplus mexicanus	22
3.	Melanoplus angustipennis	6
4.	Ageneotettix deorum	4
5.	Aulocara elliotti	3
6.	Seventeen other species	20

Nymphs, 1.35
Undetermined adults, 0

WYOMING--(Continued)

Reversion

	Percent
1. Melanoplus mexicanus	32
2. Melanoplus foedus foedus	13
3. Aeoloplus turnbulli	13
4. Melanoplus angustipennis	9
5. Melanoplus bivittatus	6
6. Twenty other species	27

Nymphs, 0.45
Undetermined adults, 0

Weeds and Sago

	Percent
1. Melanoplus mexicanus	31
2. Camnula pellucida	10
3. Ageneotettix deorum	10
4. Aulocara elliotti	8
5. Melanoplus femur-rubrum	6
6. Thirty-five other species	35

Nymphs, 0
Undetermined adults, 0

Idle land

1. Melanoplus mexicanus	68
2. Aulocara elliotti	11
3. Ageneotettix deorum	7
4. Melanoplus packardii	3
5. Melanoplus angustipennis	3
6. Ten other species	8

Nymphs, 0
Undetermined adults, 0

Abandoned land (fields)

1. Aulocara elliotti	27
2. Ageneotettix deorum	26
3. Camnula pellucida	13
4. Melanoplus mexicanus	13
5. Amphitornus coloradus	6
6. Four other species	15

Nymphs, 0
Undetermined adults, 0

Environment not shown

1. Melanoplus mexicanus	80
2. Camnula pellucida	7
3. Melanoplus bivittatus	5
4. Melanoplus packardii	5
5. Aulocara elliotti	3
6. No other species	

Nymphs, 0
Undetermined adults, 0

Percentage of grand total

1. Melanoplus mexicanus	25
2. Melanoplus femur-rubrum	14
3. Melanoplus bivittatus	10
4. Camnula pellucida	8
5. Ageneotettix deorum	4
6. Sixty-eight other species	39

Nymphs, 5.35
Undetermined adults, .01

SUMMARY

The most spectacular event of the 1937 outbreak was the infestation of Dissosteira longipennis in Colorado, New Mexico, and Texas. The most interesting from an entomological standpoint was the second generation of Melanoplus mexicanus, which began hatching about August 20 and actually produced a second outbreak of hoppers in the winter-wheat sections. This species has steadily advanced in its importance over other species since 1933. There are, however, fairly well defined areas where certain species are dominant. Melanoplus femur-rubrum is now dominant in the areas comprising northeastern Iowa, south-eastern Minnesota, southern Wisconsin, northern Illinois, Idaho, and Utah. M. differentialis is dominant or very important in southern Iowa, northern Missouri, eastern Kansas, eastern Nebraska and most of Oklahoma and Texas. M. mexicanus is the most important species in the Dakotas, western Nebraska, Kansas, and most of Montana and Wyoming. Dissosteira longipennis is by far the dominant species in the northeastern counties of New Mexico, the Western Panhandle of Texas, the Panhandle of Oklahoma, and southeastern counties of Colorado. Camnula pellucida was of local importance in the States farthest north.